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May 1953 25¢

SCIENCE AND INDUSTRY

Organic Gardening

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MAY 19 1953

STACKS

THE MAGAZINE FOR DISCRIMINATING GARDENERS

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only
$134.00

YOU can really ENJOY your gardening efforts with this versatile, efficient tool. Many home gardeners are finding that they get real relaxation and enjoyment after a hard and tiring day at their regular jobs —by gardening with their ROTO-HOE and its attachments.

GET THE FACTS—*You'll be glad you did!*

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	$251.00

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In the rush of modern living more and more people are learning that their doctors are right—it is important to one's health to have active physical participation in some good hobby. And plenty of folks feel that gardening is one of the best hobbies—but it can be hard work without the use of proper tools. So let ROTO-HOE do the hard work for you—you get the healthful relaxation without the tiresome difficult work.

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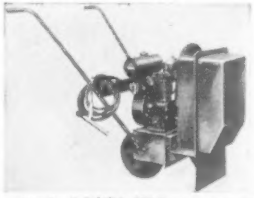

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Now we offer for the first time the new Roto-Zephyr Sprayer—for spraying trees and plants around home and garden. The Bonderized and enameled 5-gallon tank attaches to the standard ROTO-HOE power unit in minutes; you can easily wheel sprayer wherever wanted. Piston type bronze pump has screen and relief valve, operates from ROTO-HOE's powerful Lauson motor. Spray gun is modern in design, light weight and foolproof. This complete ROTO-ZEPHYR Sprayer attachment costs only $77. to add to basic unit —or may be purchased separately. See your ROTO-HOE dealer.

ROTO-HOE & SPRAYER CO.
Box 2, Newbury, Ohio

Yes, I want the facts about ROTO-HOE and attachments—how it can give me more of the FUN in Gardening. Send your free color folder at once, and tell me name of nearby dealer where I can see ROTO-HOE.

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New Mineral-Rich Soil Conditioner Contains

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Restores vital organic matter and humus . . . replaces essential minerals and trace elements . . . activates soil bacteria . . . introduces new plant food . . . unlocks plant food already present in soil . . . lowers or neutralizes alkalinity . . . encourages soil organisms . . . promotes better soil aeration . . . stimulates subsoil, acts continuously from season to season.

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Orga-Min will help you raise more succulent vegetables, more brilliant flowers, finer fruit. Easy to spread in any standard spreader or by hand. No danger of burning plants. For lush lawns spread average of 8 lbs. Orga-Min per 100 sq. ft. of grass 3 times a year. Get maximum nourishment to vegetables and flowers by working Orga-Min into soil as side dressing when cultivating. Give flowering shrubs, nut trees annual boost they need with 5 lbs. of Orga-Min spread around base and dug in. House plants, too, thrive on Orga-Min conditioning. One half cup to each quart of potting soil results in sturdier leaves, more flowers.

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Organic Gardening

Vol. 21, No. 5 May, 1953

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Seaweed as a Fertilizer brings an important and accurate analysis of the surprising values and effective uses of this abundant, organically rich natural material. **Try Your Luck with Begonias** presents success-insuring suggestions for this fascinating flower by an internationally famous begonia culture expert. **Help for the Gardeners** offers a convincing, practical contingent of reasons for aiding our feathered populace—who in turn help the gardener amazingly. **Practical Pruning—Part IV: Ornamental Trees and Shrubs** concludes this valuable series with a practical review of this aspect of decorative tree and bush care.

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frontiers and fertility

As a subscriber to both *Prevention* and *Organic Gardening*, I think this excerpt may interest you.

Dr. Walter Prescott Webb, in *The Great Frontier* (Houghton Mifflin Co., Publisher), says as follows:

"The frontier added something extra to what was present; science makes more finished materials available, but the frontier provided more room and more raw materials." The author cites the example of scientific "farming methods that double or quadruple the yield of an acre." This achievement doesn't impress him, "for it adds only depth to our resources of land—not length and breadth, as the discovery of *new land did.*" And he adds, "if technology does to the third dimension (in exhausting resources) what it has already done to the first two, the earth will be poor indeed."

The above is an excerpt taken from the weekly, *Business Week.*

George M. Bushhad
New York, N. Y.

THE COVER

"Bird's Angle" reflects a recognizable symptom of the exuberant re-awakening that is Spring. Lest the feathered redbreast's intent preoccupation with friend wiggler be too deceptive to many gardeners, let's all remember that our winged warblers definitely contribute a diligent, yeoman service in keeping our soil and plants free from the greedy infestation of countless destructive insect pests. Hats off to the helpful birds, to the indispensable earthworms, to radiant Spring—and to ORGANIC GARDENING'S Karl Manahan for this colorful cover!

Our readers will be interested in knowing that we have had many poems submitted which admirably paraphrased Mr. Bowers' "One Reader's Comment" published in The Forum in our February issue. These offer rather resounding refutation of the sentiments expressed by the earlier rhymster. It is regrettable that space limitations prevent our printing them all. We have, however, chosen one which follows.—Ed.

another reader's comment

Your facts are so believable . . .
Your theories so provable . . .
Your tolerance so flexible . . .
Your claims so pardonable . . .
Your subscribers so approvable . . .
Your research so applaudable . . .
That your "Forum" may find this
quite printable.

J. P. Gibbons
Chicago, Ill.

leaf mulch and ladybugs

My garden was almost entirely free of insects last summer although I used no sprays or dusts during the entire season.

Along to one side of my garden I have some tea roses that I protect with fine mesh poultry wire and then fill half full of leaves I rake from my yard. Hundreds of ladybugs or beetles live in the mulch through the winter. Instead of burning the leaves, as many gardeners do, I put the mulch in my vegetable garden between the rows and I'm sure the little bugs work for me all summer. I always have a border of flowers around my vegetable garden, so the mulch I use on them also contains these helpful insects.

I was curious to know if the bugs were in the leaf mulch again this spring, so today I looked—and sure enough, there they were.

Miss Jewell M. Richerson
Buffalo, Missouri

city composting information

We are gathering material for a book on the use of garbage or sewage by towns and cities for composting and fertilizing purposes. We should appreciate very much any information on this type of project which your readers could send us.

Please send information to:

Mrs. Mary Pierce
Dublin, N. H.

New Organic Gardening Clubs

We extend a cordial welcome to the following Organic Gardening Clubs and wish them every success in their programs and work.

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Dinuba Organic Farm & Garden Club
A. R. Hutton
167 First Ave., *Dinuba*

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Dept. O Ballston Spa, New York

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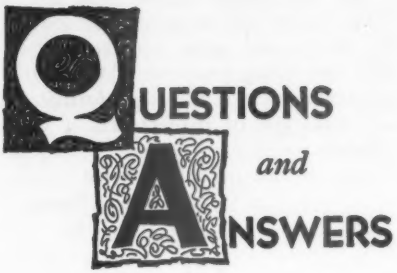

plants for hedgerow

Q. What plants, trees, bushes and berries are most suitable to grow in the hedgerow?

A. The best plant choices for growing in the hedgerow are native plants, particularly those which provide food for vegetation. Recommended are Rose Multiflora, elderberry, choke cherry, mulberry, other varieties of cherries and any of the native plants which are entirely hardy in your region.

winery wastes

Q. Do you recommend the use of residues from wineries for compost?

A. Yes. The wastes from wineries are valuable compost materials. Other important fruit wastes include apple pomace, peach and plum pits, spoiled citrus fruits, and similar residues that may become available.

planting potatoes

Q. Can I plant my potatoes whole instead of cutting them?

A. It is all right to plant small potatoes whole, and they will sprout better and more uniform than those that have been cut. When the potato is cut the minute cells are damaged. A callus must be formed before the tuber will sprout. Sometimes this callus doesn't form and the seed piece rots in the ground. The whole potato retains its inner moisture to feed the sprouts for a long time.

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Here's the light-touch No. 5 shear—operates with a flick of the fingers. Bulge design lets you cut easily with left or right hand . . . Neoprene Rubber stops prevent sting or jar . . . velvet soft grip. 5" blades . . . 12" overall length . . . Order yours today—$2.95!*

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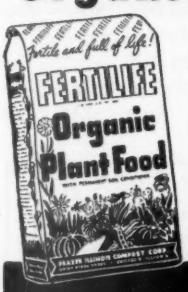

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kelps for composting

Q. Can the kelps (brown algae which live in the sea) be used in the compost heap?

A. The kelps are excellent composting materials and are a good source of potash and iodine. The potash content of kelps, according to the species, varies from one to five per cent. The giant kelp, *Macrocystis pyrifera,* is a perennial which can be harvested several times annually. The potash content of the dry tissue is about 1.5 per cent. Kelps also contain iodine in sufficient amounts to meet the needs of plants.

kitchen drain

Q. Our garden is on a terraced hillside. We are building a new drain to our kitchen sink. Would it be practical to let it drain into the "compost pile" at the foot of the garden; it would be tiled to the "pile" or pit made of cement blocks.

The pit has a pipe for overflow of water that will run into a tub or barrel that can later be used for watering plants that need it. Is this practical? Would there be enough fertility in this water to pay to carry it to the plants?

A. Unfortunately kitchen drains carry a goodly amount of fatty substances which are not easily broken down by soil bacteria and thus prevent the formation of good compost. There is another consideration: Since you could not adequately control the influx of water from the sink, the chances are that your pit would become waterlogged; inevitably, the

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The soils of Virginia and the Southeast are not the only ones that show remarkable response when ActivO is used to instill them with dynamic life and energy—and genuine condition. Just mix a few handfuls of ActivO with fertilizer, compost, mulch, seed, or direct in soil and see how much healthier your plants grow. ActivO sizes at $1, $2.59, $5.95 and $19.95.

WONDERLAND NURSERIES Ellerson 4, Va

nutritive substance, especially nitrogen, would be leached out and lost to your garden.

As to watering plants with kitchen water, the fat particles are apt to cause trouble sooner or later, since the plants breathe through their many pores, called stomata or mouths, and these would be clogged by fatty water.

potash qualities

Q. What characteristics should be considered in selecting a source of potash for soil building?

A. The natural pulverized potash-bearing rocks seem to be the best source of potash for restoring potassium to a soil in which this element is deficient. In selecting a pulverized rock, remember that the percentage of potash present in the rock and fineness of the rock are both exceedingly important. To be reactive in the soil, rock particles must have the fineness of silt. This means that about 80 per cent of the rock particles should go through a 250 mesh screen.

phosphorus for the compost heap

Q. What is the best source of phosphorus for the compost heap to be used in fertilizing soil that is deficient in phosphorus?

A. Phosphorus may be added to the compost heap and to the soil in the form of raw pulverized phosphate rock or as bone meal. The soil acids will make these relatively inert forms of phosphorus soluble in sufficient amount to meet the needs of the plants.

YES, you can SPRAY ActivO on Your Soil!

ActivO puts billions of beneficial bacteria, plus accompanying bioties, hormones, enzymes, vitamins, minerals and conditioning agencies, into every cubic yard of topsoil. Just mix with water and sprinkle or spray on. $2.59 size dynamically energizes 3 acres; $5.95 size, 9 acres. Both prepaid.

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ORGANICALLY GROWN

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1506 W. Rosedale Fort Worth, Texas

WITH THE EDITOR

are we using too much compost?

Part III

J. I. RODALE

An article was published in the *Agronomy Journal* (January, 1949), entitled "Nitrate in Foods and its Relation to Health," written by Dr. J. K. Wilson of the Department of Agronomy of the N. Y. State College of Agriculture (Cornell) which represents a revolution in agricultural thinking, coming as it does from so conservative an organization as Cornell. This article is an especial indictment of the fertilizer, nitrate of soda, regarding the use of which we have always been so outspokenly opposed. It is too bad that Dr. Wilson died soon after this article was published. He could have become a valuable friend of the organic movement.

Dr. Wilson begins his article with the following statement: "In 1943, the author pointed out that nitrates in the food of animals may be reduced by bacteria to nitrites and that these are likely to cause poisoning through combination with the hemoglobin of the blood." Nitrate is NO_3, that is one atom of nitrogen and three atoms of oxygen. When one of the oxygen atoms is lost from the molecule, we then have *nitrite,* that is NO_2. It would seem that the nitrate is unstable.

Is the nitrate that results from organic matter just as unstable as the nitrate from nitrate of soda? That would be difficult to say, but until sufficient experimental work is done, we must go on the assumption that there is no difference, and should guard against the possibility of excesses of nitrogen by not overcomposting the soil used for growing food crops.

Professor Douw G. Steyn of the Department of Pharmacology, Medical Faculty of the University of Pretoria, in his writings has favored the organic method, but indicated that there was danger of stimulating the accumulation of nitrates in plants due to the use of animal manures, especially the urine portion.

I wrote to Dr. Steyn and he replied as follows under date of March 3, 1952:

"What I tried to explain in my article was that animal excreta (and especially urine) which is used to a large extent in the making of compost in this country, stimulate the accumulation of nitrates in plants grown on soil fertilized with compost. I am very much in favor of the use of compost as a fertilizer. We have to use fertilizers, but we must do so in the right way and we should conduct fur-

ther experiments in order to gain more information about the correct use of these valuable materials. I do agree that nitrates from chemical fertilizers will lead to greater accumulation of nitrates in plants than when compost is used."

There is a question about the correctness of the latter statement. Until actual experimental research on the subject is done, we cannot be too sure of it. In the meantime, I have received another letter from Professor Steyn which is worth reproducing:

"Dear Mr. Rodale,

"Thank you for your letter of the 23rd ultimo. I am glad that you intend drawing attention to the possibility of using too much compost. We have to obey the laws of nature. Anything, no matter how good and wholesome it is, is harmful when used in excess. I am in perfect agreement with you that too much compost will create imbalances in the plants in exactly the same way as too much of any food factor in our diet will create imbalances in our bodies, and disease. It is for this reason that I feel that it is much better to use compost, a fertilizer containing many useful and nitritious substances for the plant, than it is to use pure nitrate. Nitrate would naturally supply more nitrogen to the plants with the result that they will build up more nitrate, and I should also mention that nitrate fertilizers are very much inclined to increase the hydrocyanic acid content of crops, which in my country is a most dangerous phenomenon. You will be interested in the following hypothesis and my remarks on it which I am quoting from one of my publications:

" 'It is suggested that the major geographical variations in cancer mortality in England and Wales are associated with variations in the content of cultivated soils, and may be conditioned by micronutrient deficiencies in food plants grown on soils of high organic content; and that populations whose diets include vegetable foods grown on such soils may be subjected to the action of carcinogens, or may be deprived of protective substances.

" 'Legon refers to the work of Dawson and Nair on copper metabolism in the course of which they established that organic matter in the soil has a tendency to fix copper in some way or other, thus rendering this element unavailable to plants.

" 'Legon's hypothesis that total cancer mortality may be associated with soil organic matter [in that either a carcinogen may exist in food plants grown on soils of high organic content, or, alternatively, that a protective substance may be lacking in such plants] is certainly of great interest and importance when we consider the very important rôle which certain trace elements (Fe, I_2, Co, etc) play in the chemical structure and physiological action of haemoglobin, hormones, vitamins and enzymes.'

"The result of Legon's investigation is just another reminder of the general application of the laws of nature in animal and plant life, namely, that normal growth and the health of man, animal and plant can be maintained *only* when they live on a "balanced diet" supplied in adequate amounts. In the case of fertilizers, an imbalance in plant nutrients in the soil will cause deficiencies and disease in plants growing on such soils just as an imbalance of minerals, protein, fats, carbohydrates, and vitamins will precipitate deficiencies and disease in man and animal. It is obvious that no standard formula can be laid down in connection with fertilizers as their nature and composition vary with different soils. On the other hand, the importance of compost to every type of soil cannot be overstressed.

"Legon's article appeared in the *British Medical Journal,* September 27, 1952, p. 700.

Douw G. Steyn."

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20 Arkansas acres . . . and the Lempkes

A depleted expanse of eroded farmland brought to plenteous productivity—and the source of a determined family's health and income

HELEN O'KEEFE, ARK.

Despite the past season's widespread severe drought, aggravated by heavy insect destruction, Washington County, Arkansas, abounds in uncommon scenic beauty, countless natural advantages, and interesting activities—one of which is Lempke's organic farm a short distance southeast of Springdale. Through this past hot, dry summer it has stood virtually an oasis of growing green crops, hampered but slightly by insect damage.

Heavy mulching in the berry beds provides a fine-textured, moist soil that accounted for the growth and production of better-than-average berry crops. On a hot, dry day in early August, Mr. Lempke dug down through deep mulch of leaves and old straw on his fine raspberry bed and brought up a handful of earth so moist that when squeezed it formed a ball that held its shape till tossed onto the ground . . . this, I saw, when all about us deep dust and parching vegetation were the common sights.

One field of green vigorous corn and peas, planted on June 16, 1952, after the start of the drought, was so outstanding a visitor asked incredulously, "Do you irrigate this corn?" No "watering" of any kind except natural precipitation is used on the Lempke acres. This corn is growing in a field that had been in strawberries for three years and had received heavy compost treatment as well as heavy leaf mulching two of the three years.

Their healthy young vineyard produced a crop of well-developed grapes that ripened several days ahead of the area average, and were marketed in small baskets rather than by the ton to our local grapejuice plant.

But perhaps you would like to hear the story of the unusual Lempkes and their organic farm?

Eight years ago they acquired twenty depleted, rock-strewn, eroded acres that, as they recall, scarcely produced a scraggy crop of ragweed. Today it requires a strong imagination to see the erosion scars, and there is little evidence of rocks. A few larger ones were removed, but most of them are still there, buried beneath several inches of fertile soil. This accomplishment illustrates the advantages of organiculture and family teamwork. Mr. and Mrs. Lempke are a wonderful team—innately industrious, friendly and intelligent—and without the handicap of a preponderance of pseudo-scientific information they went to work. Actually, to *works* would be a more accurate term because circumstances required that they make a living for a growing family while making a farm out of their depleted acres. And teaching that group

of splendid boys and girls the inestimable blessings of integrity, useful occupations, courtesy, and appreciation plus fundamental religious concepts has gone right along with earning the daily bread.

Four years passed. Much had been attained: fences, new barn, and chicken house built; fine young vineyard started; family gardens in production; meat and dairy animals for family use on the farm. But a heavy toll had been exacted. The first flush of enthusiasm and ambition had spent itself; the family health level was down to an annoying low. Fortunately about this time Mr. Lempke made a contact that convinced him that foods high in nutritional value—grown from soil rich in the elements needed to produce such foods and free from the residues of poisonous sprays and caustic fertilizers—would go far toward improving the family health pattern. However, in abandoning the standard fertilizing and spraying practices some efficient substitute must be forthcoming—and rapidly. Hence was born another compost-builder and follower of farming principles.

To an already busy schedule had to be added the task of collecting tons of raw materials that could be turned into compost. There was no scarcity of materials to be had—for the labor involved: brooderhouse litter, mowed weeds, loads of leaves, old hay and straw, barnyard manure and bedding all went into great heaps of compost. The compost went onto the gardens, the berry patches and the vineyard. In the spring, rye and vetch were planted in the vineyard but the vetch didn't come up that first year; the rye

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Lempke demonstrates how rich and friable is his finished compost, here being applied in corn field.

Turning compost prepared from brooderhouse litter, mowed weeds, old hay and straw, barnyard manure, and leaves.

Flourishing corn, despite the 1952 severe drought and insect deluge, proves compost turned the trick.

design for dahlias

A practical review of dahlia care and culture for the beginners

A. C. RONNING, MINN.

Discovered in the mountains of Mexico in the 16th century by a Spanish physician and later named in honor of Andreas Dahl, a Swedish botanist who labored for its culture and development, the dahlia has deservedly become a flowering favorite. They are a genus of tender herbaceous perennial plants growing from tuberous roots, and as such are, of course, not hardy in the colder climates. There are several cultivated species, the most widely grown two being *D. pinnata* and *D. juarezi,* all cactus forms stemming from the latter. Of these two species alone, there are thousands of hybrids, creating such a wide variety that dahlias enjoy worldwide popularity.

the garden plot

Dahlias will grow in all types of soil from light sandy to heavy clay provided there is a reasonable humus content free drainage and sufficient moisture retention. When selecting a plot for dahlias, it is well to remember that there is no substitute for sunshine. Select a spot where there is a maximum number of sunlight hours. Morning sun is preferable and shade in the mid-afternoon is an asset as it provides relief from the heat and gives the plants an opportunity to recover moisture loss due to evaporation.

The dahlia bed should be well-drained and spaded to a depth of at least twelve inches as early as the ground can be worked. Dahlias are greedy plants and their successful culture requires a great deal of plant food. Quantities of organic matter in the form of barnyard manure and compost should be worked into the bed. This should be done in the fall

Stakes six feet in length, driven 12 inches into ground, spaced 3 feet apart, are excellent supports and should be placed before planting.

when possible; however, well rotted manure may be applied in the spring. After the plot has been spaded and smoothed with a rake, broadcast ten pounds of bone meal, and ten pounds of potash rock to each 100 square feet of the dahlia bed and rake in thoroughly, working in some finely pulverized greensand as well.

planting

Dahlia roots should be planted about May 15th, and dahlia plants about May 30th. Each large dahlia plant requires nine square feet of space. Miniatures and pompons thrive in a somewhat smaller space. When getting ready to plant, first measure and mark the places for each plant, then set the stakes, for each plant must be tied to the stake as it grows to avoid whipping in the wind. When stakes are properly alined, the dahlia roots are planted on the south side of the stake in a hole six inches deep and at least six inches in diameter. The roots should be placed horizontally about two inches from the stake with the tip of the eye or sprout pointing upward. Cover the root with two inches of soil, fill the hole gradually with soil as the plant grows. If more than one stalk appears, allow only the strongest one to grow. With large roots (four inches or more) cut off the end, leaving about three inches for planting.

When setting dahlia plants, remove the two lower sets of leaves and plant two inches deeper than they were in the pots. Water plants well before tapping them out of the pots. It is best to set them out in the late afternoon or on a cloudy day, and if the ball of dirt around the plant has been broken or disturbed, shade the plant for 24 hours. Many growers place a ring of cardboard or paper around the plants or the sprout of the root at the time of planting. This will usually keep cutworms, which work just under the surface of the soil, away from the tender plants.

cultivating

Dahlias need to be cultivated regularly after each rain or watering. The soil should be kept loose at all times. After August 1st deep cultivation should be discontinued, as the feeder roots cover the entire area and are very near the surface. At this time the dahlia bed may be mulched with marsh hay, oats, straw or any other good mulching material. You will find mulching an aid in converting moisture and, at the same time, it will protect the surface feeder roots.

pruning

When the dahlia plants have attained a height of about ten inches, the center or crown of the plant is pinched out to induce the lateral buds to develop. In a short time laterals will appear at the base of each leaf. It is usually desirable to allow four laterals to grow. Any others that may appear should be removed. On each of these laterals three buds will emerge; the side buds are removed,

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Photo: Roche

A variety of single dahlia that is pleasing in its graceful lines.

double purpose trees

Nut trees lend not only a wealth of landscaping beauty but a source of nutrient-rich food as well

LEWIS EDWIN THEISS, PA.

Nut trees have so much to recommend them that they should be more widely utilized in home planting. These trees are extremely beautiful, having most attractive foliage and a delightful autumn coloring. Furthermore, they produce crops of the highest value.

Although nurserymen have as yet made no effort to produce dwarf nut trees, there are nut trees that range in size from small, bushy plants to towering giants and so meet any purpose on the home grounds.

The wise householder plants not only with regard to his own premises, but also in relation to things that are visible outside his grounds. He may wish either to emphasize the beauty of things seen beyond his boundaries or to shut them completely from view. There are nut trees that will do all these things well.

Either the Black Walnut or the Pecan—northern varieties for cooler areas—become large spreading trees that can add that indefinable touch of a home that is cradled beneath protective trees which also make beautiful growths with which to adorn the lawn.

Where smaller trees are desired, the Heartnut, the Chinese Chestnut, the Persian (or English) Walnut, or the Hickory fill the need. As for low, bushy growths, the Chinese Chestnut, left unpruned; the Filbert, grown in bush form; or the Chinkapin meet the need exactly.

In these days of high costs, every householder would be wise to use productive plantings instead of filling his grounds with plants which are wholly liabilities. Nothing produces food of more value than do nut trees.

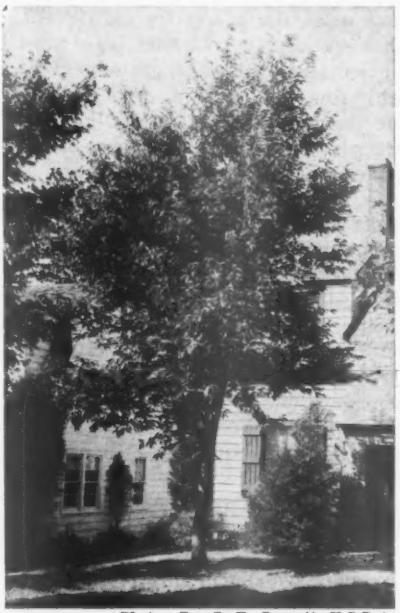
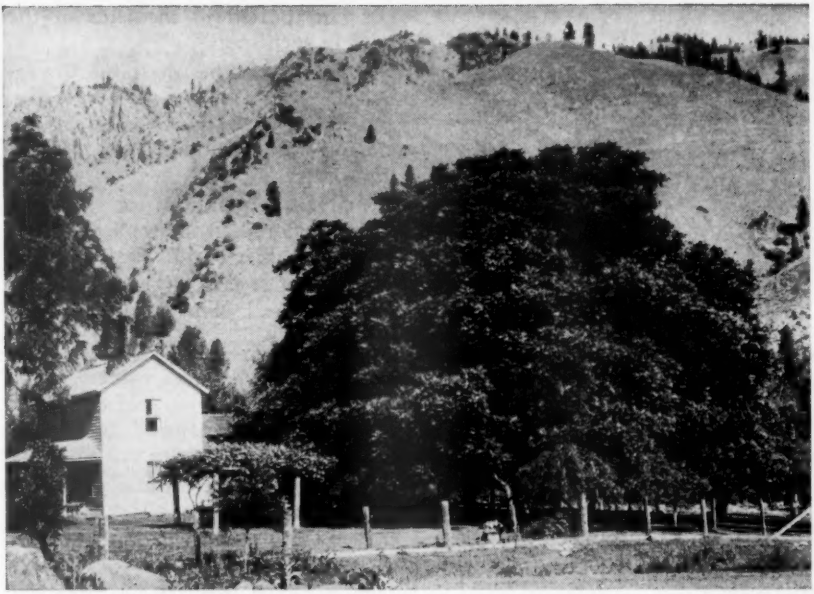


Photo: Dr. G. F. Gravatt, U.S.D.A.
Tall Chinese Chestnut—growing on a lawn.

Dr. Robert T. Morris, famous New York surgeon who founded the Northern Nut Growers Association,



This 40-year-old Japanese Walnut on a ranch is a perfectly symmetrical specimen.

Photo: K. D. Swan, U.S. Forest Service

gives us facts as to the food values of nuts. Possessing a large estate, and wishing to grow nut trees himself, he planted a number of them. But, in his day almost no one knew anything about growing nut trees. So Dr. Morris got in touch with other enthusiasts and created an organization to study nut culture. His great interest was in the food value of nuts for his patients.

Dr. Morris wrote that he secured much of his information from Dr. J. H. Kellogg, of the famous sanitarium in the mid-west. Nuts, the latter says, furnish starches, fats, and proteins, the three essential food elements. But different nuts supply them in varying proportions. Almonds contain 21% protein, 54% fats, 17.5 starches, and 22% ash. Fresh chestnuts contain only 6% protein, 5.4% fat, 42.1% starch, and 1.8% ash. Peanuts, though technically not nuts at all, contain 30.5% protein, 49.2% fat, 16.2% starch and 2% ash.

From these examples one sees how much food value there is in nuts. Certainly these figures show that far from being merely delectable tidbits as we commonly consider them, they are really nutritive foods. In short, a nut kernel is a small packet of food, packaged by nature in an absolutely sanitary container. Were it not for the fact that our topsoils are largely depleted by lack of organic matter, the food value of all produce would naturally be greater. Many of the food elements necessary to perfect health are largely leached or eroded out of the soil, therefore food produced in

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Bush-like hazelnut, Rylus purpurea.

Photo: J. Horace McFarland Company

June

the north

• Plant seed for late cabbage, cauliflower and broccoli first week in June at latest, to be transplanted mid-July.

• Sweet corn planted early June will make rapid growth, and could be followed by a mid-month planting.

• Plant beans, beets, carrots, kohlrabi and turnips for a late crop, digging in one-half pound each of phosphate and potash rock for each 10 square feet.

• After the usual June drop of peaches and plums, if the set of fruit is heavy, thin them so that the peaches have at least a six inch space between them and the plums at least two inches.

• Cultivate rose beds thoroughly and water them with liquid manure or liquid compost.

• Dahlia roots may still be planted, but don't forget to set stakes for the dahlias at the same time so that roots will not be injured by staking later.

• Perennial seeds may be sown either in the coldframe or in the open garden. Preparation of the beds should be quite thorough with a good mixture of compost, bone meal, and lime (the latter if necessary).

• For shady places plant tuberous-rooted begonias, gloxinias and primroses. Potted palms and ferns may be put out, buried to the rims of the pots, in such spots.

• It is sometimes desirable to curtail the lateral growth of evergreens, and this may be accomplished by removing the terminal buds of such limbs.

• Make preparations for gathering mulch material to be applied during the hot weather of July and August.

• Save your grass clippings and any other material gathered in cleaning the garden beds.

the northwest

Eleanor McConnell, Oregon

• Time now for organic gardeners to try to coax the bees back into our gardens. Foolish use of DDT in recent years has killed many of them, but we need them in our gardens and can plant flowers which they love. Monarda (known also as bergamot and bee-balm), is a favorite of the bees and, in addition, is very attractive. The bees are also attracted by cleome, the spider plant.

• Drop root vegetables into a bucket of water after gathering them. Ready them for the kitchen by washing and removing the tops. Contents of the bucket and the tops may then be put on the compost pile.

• Cut delphiniums back to about 12 inches after blooming. Feed and water them well with liquid manure or organic fish emulsion and a second bloom will come along later.

• Last call for taking chrysanthemum cuttings. Those started now will develop into smaller plants than those which had an earlier start.

• Try planting gladiolus with iris. Foliage is similar and the blooms will fill in that empty spot after iris have finished blooming.

• Continuous blooming plants, such as arabis, phlox, and pansies,

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COURSE IN ORGANICS

By J. I. Rodale

INTRODUCTORY

ORGANIC GARDENING'S informative and valuable new department, which is bringing a clear and thorough coverage of every phase of the organic method of gardening, now reaches its fourth lesson. The Course, starting with the February issue, has, to date, interestingly offered lessons defining, explaining, and evaluating organics, humus and humus color. In presenting Lesson IV on The Dynamic Quality of Humus, may we remind you that Mr. Rodale has begun a concurrent course on "The Soil" in *The Organic Farmer* (Emmaus, Pa., $3.00 a year; $7.00, 3 years) and that following and learning from this series as well is urged for every *Organic Gardening* reader who is eager to become expertly informed on all phases of the theories and facts underlying the organic method.

ORGANIC MATTER

Lesson IV — The Dynamic Quality of Humus

TO some persons humus is humus and that's all there is to it. But that is *not* all there is to it. To know the true value of humus as a factor in making plants grow we must delve below the surface and find out a thing or two about its activities. Mere quantity may not mean too much. We must realize that we do not want humus for its mere presence. We want it for what it can do for the soil and for plants.

When we place either raw organic matter, or what we term finished compost into the soil, decay begins to take place. If there was no decomposition these substances would be of little value in the soil. As it decays, nitrogen and other substances are released when there is sufficient organic matter for a continuous process of decomposition to go on; there is always a goodly stream of nitrogen coming from it. There is a dynamic quality, a movement from the organic matter that is required, if it is to be of any value. Were all the organic matter to be applied to the soil in the most advanced stages of decay, there would be no nitrogen available from this source.

Prof. Sidney B. Haskell, Director of the Massachusetts Agricultural Experiment Station, in his book *Farm Fertility* (Harpers, 1923) says:

"The benefit comes not so much from the character of the final product as from the process of decay taking place in the soil itself. Organic matter to be functional in the soil must decay in the soil; and decaying, the supply must be constantly renewed. Otherwise we either have a barren

condition of the soil, brought about by two great a decay of this humus and failure to replace it, or an equally unfavorable condition in which the soil organic matter is dead and inert, like so much peat, or in extreme cases similar in its inertness to coal itself." Thus we have the terms living and dead humus.

A. F. Gustafson, *Nitrogen and Organic Matter in the Soil,* (Cornell, March, 1941) says:

"It is the newly decomposed organic matter on which crops depend mainly for their nitrogen."

In this publication he gives an interesting example of the difference between two soils. An Ontario loam contained three per cent organic matter. The Volusia silt loam had 5.2 per cent. But yet the latter, which had about 70 per cent more organic matter, yielded less in crops. The author says that one of the reasons is that the organic matter in the Ontario loam was more active. He states, "Much of that in the Volusia is so inactive that one might regard it as being in a sense embalmed." He advises the liberal addition to it of green manure, leguminous crops, the results of which should not be harvested, but plowed in.

Here we can see that if we wish to produce the most dynamic qualities in the new organic matter, much would depend on the kind of organic matter we plow in. If we put peat into the soil, the dynamic movement of nutrients from it will be very slow. Humus, whether it is in the form of coal or of fresh organic matter represents stored energy, but if it is to be of any value, it must give it off.

It has been found also that when fresh organic matter was added to a soil there was an acceleration in the rate of decomposition of the existing soil organic matter. It probably has something to do with the stimulation of the soil bacteria, somewhat akin to giving them a shot in the arm. There are peculiarities in the rhythm and timing of decomposition. Another example is a virgin soil which is first put under the plow. The rate of decay of organic matter is very fast at first, but soon it slows down. Evidently the soil bacteria require continued stimulation. This stimulation brings about that dynamic quality of which this lesson is the subject.

In the tropics the movement is faster than in the temperate zone, and thus there is always an urgent call for fresh organic matter. The four conditions that make it ideal for microorganisms to do their share in the processes of decomposition are temperature, moisture, acidity and aeration. The higher temperatures in the tropics overstimulate bacteria.

Coming back to our general subject, here is an interesting quotation from *Farm Soils—Their Management and Fertilization* by Edmund L. Worthen (John Wiley and Sons—1941):

"While the fresh, active organic-matter content of a soil is an important criterion of its degree of fertility, an unproductive soil may contain a considerable quantity of humus, even enough to produce a dark color. Organic matter in the form of humus contains a smaller proportion of the more essential plant-food elements than does fresh organic matter, and is in such an advanced stage of decomposition that it is very ineffective. It is sometimes referred to as the inactive form of organic matter. It not only has little chemical effect, but it is less beneficial than fresh organic matter in improving the physical condition of the soil, or in stimulating activities of the beneficial soil organisms."

Degroff and Haystead (*The Business of Farming*—University of Oklahoma Press) say:

"The more there is of organic matter in the soil and the more rapid its decomposition, the more rapidly plants will grow." Note the expression "the more rapid its decomposition." There must be this dynamic movement for humus to exert its full value. It is of little use if it does not break down. Another writer refers to it as the organic balance—the balance between the constant addition and the constant subtraction of humus.

We should bear in mind that organic matter as such is much more dynamic than the humus which it produces. When you apply fresh organic matter to the land there should begin at once a strong movement of decomposition if conditions are right. Of course, the rate for a thin-stemmed legume plant will be much faster than for a whole corn cob. This process begins as soon as the organic matter is covered with earth. If left on the soil surface, the rate of decay will be much slower. When some of the organic matter turns to humus there will be a slower rate of decay. The humus much more slowly begins to break apart so as to give some of its nutrients to the soil solution.

OTHER NUTRIENTS

Adrian J. Pieters in his *Green Manuring* (John Wiley & Sons–1927) compares humus from a new and from an old soil. The new soil contained 8.12 per cent nitrogen, the old, 6½ per cent. The new soil also contained much more in the way of minerals, which indicates that it is not only nitrogen that is given off in the stream from fresh humus. The fact is that the whole array of minerals is held in the organic matter and a fast decomposition releases more of it for use by plants. A great part of the soil phosphorus, for example, is held in the organic matter. In a study of *Iowa Soils* (Pearson and Simonson), it was found that between 27 and 72 per cent of the total phosphorus present was in the organic matter.

Quoting from Lyon and Buckman *Nature and Properties of Soils*–(Courtesy of the Macmillan Co., copyright 1950): "In recent years, Baumann by his researches has shown freshly precipitated organic matter to possess properties which are largely colloidal in nature (very fine). Among these characteristics are high water capacity, great absorptive power for certain salts, ready mixture with other colloids, power to decompose salts, great shrinkage on drying, and coagulation in the presence of electrolytes." These characteristics would not be present, or would be present to a much lesser extent, in older humus. All of these powers are part of the formula of dynamism. It speaks of action and fast movement.

WHAT HUMUS DOES

During the decay of organic matter certain acid substances are produced which have a solvent action on minerals, thus making them more soluble, and available to plants. One of the principle acids is carbonic acid. These acids are produced with the aid of microorganisms–bacteria, fungi, etc. A certain amount of carbon dioxide is important to the production of crop yields. It saturates the soil water, forming an acid solution which has a solvent action on the minerals in the soil, making them available for plant use. Thus we see the principle reason for keeping a fresh supply of organic matter on hand in the soil.

RESISTANCE TO DECAY

In the process of humus formation when the decomposition gets to a certain point it slows down. A certain portion becomes resistant to the activities of microorganisms, and remains in an undecomposed state. There is a point then where there is a hold-up in the composition for a period of time. Under some conditions the decomposition process stops altogether and eventually peat or coal is produced. This is where the soil becomes more or less permanently covered with water, and asphyxiation occurs. If there is little addition of organic matter from year to year in a soil, after a while, it will contain humus that is old and which lacks the required dynamic quality. That is what happens in farms and

gardens where too much dependence is placed upon chemical fertilizers.

ANAEROBIC CONDITIONS

In cases where anaerobic conditions exist, that is, where air is lacking, there is a slower decomposition, but in considering this point there is a difference whether the anaerobic conditions exist in a composting process outside of the soil, or whether it is in the soil itself. In an aerobic decay there is an oxidation which, roughly speaking, is a "burning out" process. If it occurs in the soil, as the nutrients stream out of the humus, they are captured and held to a certain extent by the soil. But if this oxidation occurs in an ordinary compost heap, much of it dissipates itself into the atmosphere. In analyses of compost made by both processes it never fails that the anaerobic compost has much more nitrogen and other nutrients.

But in the soil, we want an aerobic condition as was shown in lesson II of the course on Soils in *The Organic Farmer,* March issue. Anaerobic decomposition in composting destroys less, so that more is available for dynamic decay in the soil. But of course it is more difficult and costly to maintain anaerobic conditions in a composting process, and that is the problem. It is a good thing to know the correct theory even though we cannot always practice it. Ideally, anaerobic conditions in compost making are the best. In the soil, conditions should be aerobic.

NEW ORGANIC METHOD

This was the basis of our advocating a change in the organic method a few years ago. Up to that time it was considered incorrect, according to accepted organic principles, to do other than make compost by the aerobic process. In the *Agricultural Testament,* Sir Albert Howard also recommended sheet composting which means the application of raw organic matter to the soil. But in the fervor of practicing the method, the emphasis seemed to be mainly on composting. Rarely was a word spoken in regard to mulching. When compost is put on the land in a finished form it tends to disappear much more rapidly than when raw organic matter is applied. The latter decays much more slowly, thus releasing nutrients gradually, and as needed. Examine a piece of soil after both kinds of treatment and you will see a big difference in the surface physical structure.

What is our attitude now? For the most part the farmer should apply most of his organic matter in a raw form to the land and permit its dynamic, moving qualities to assert themselves there. He will get the most out of it that way. There are certain problems involved, but there is not sufficient room to discuss them in this lesson. The gardener will do some composting and some mulching. Occasionally he will dig in some ground up raw organic matter, out of season.

In a later lesson I will discuss the work of Professor Dhar in India. Dhar applied raw organic matter in the form of molasses to the surface of soils and found that considerable amounts of nitrogen were produced from the air.

CONCLUSION

The lesson is clear! We now understand that decomposition goes on in a soil as well as in a compost heap and that we must not fear applying raw organic matter directly to the soil. We know a little more than we did before about the term finished compost as used by the gardener. Compost is far from a finished substance. We must learn so to choose and so to handle our organic matter that when it *is* applied to the soil it will return to us the most value.

INSTRUCTIONS

Read each question and refer back to the article for its answer. Then read the questions a second time, attempting to give the answers from your mind. In no instance should answers to the questions be mailed to us, nor can we enter into correspondence concerning this course which is primarily intended for the benefit of each reader. Correct your own written answers by comparing with the text of each lesson and mark your work accordingly.

QUESTIONS

1. Briefly, define what is meant by the dynamic quality of humus.
2. What determines the value of either raw organic matter or finished compost placed in the soil?
3. Why would organic matter in the most advanced stages of decay be of no fertilizing value?
4. Distinguish between living and dead humus.
5. On what do crops depend mainly for their supply of nitrogen?
6. How do the effects of green manure, or leguminous crops, and peat added to the soil differ?
7. Name the four conditions that make it ideal for microorganisms to aid in the processes of decomposition.
8. What affect do the higher temperatures of the tropics have on bacteria?
9. Compare the rate of decay of fresh organic matter and humus in the soil.
10. Explain the release of other nutrients besides nitrogen that are given off in the stream from fresh humus.
11. What are some of the colloidal characteristics of freshly precipitated organic matter?
12. In what way is a certain amount of carbon dioxide important to the production of crop yields?
13. What is the result if there is little addition of organic matter from year to year in a soil?
14. Distinguish between aerobic and anaerobic decomposition.
15. Which of these decay conditions are ideal in the compost heap? Which in the soil?
16. What are the benefits of putting raw organic matter on the land rather than finished compost?
17. What is the clear, important conclusion drawn from this lesson?

REVIEW QUESTIONS

How well have you retained the essentials of Lesson III? Here are a few review questions which have been simplified and are answerable by *True* or *False*. Test yourself (avoid guessing) and then check with the answers on page 60 of this issue.

1. The longer the decomposition, usually the darker the color of humus becomes.
2. In a plant, the green chlorophyl masks the other colors while it is alive.
3. The darkness of humus is due to the presence of a large amout of carbon.
4. The decomposition of animal matter gives a darker humus than that coming from plants.
5. In the majority of situations, the darker the soil, the more fertile it is.
6. A darker soil may be five or six degrees warmer than a light colored one.

need elbow room? . . . here's a five-row-plan

No more problems of vegetable garden-crowding with this clever, workable planting scheme

WILLIAM GILMAN, VT.

The Russians may have Five-Year-Plans for other things, but Vermonter Roy VanSkoik prefers his Five-Row-Plan when it comes to raising a well-behaved garden. It's his method of solving cucurbit troubles in May rather than fighting an unholy mess in August.

From August on is when you hear those yells in the unplanned garden for elbow room. That's when the cucurbits—standard pumpkins, winter squashes, cucumbers and melons—are aiming their vines all over the lot. No matter how much you love a melon or squash you don't want it infiltrating everything in sight—blanketing beans and onions, strangling cauliflower and tomato, making a helicopter necessary when you want to pick sweet corn. So, if you're ambitious, you plant the ramblers off by themselves, meaning extra garden space, or else you simply do without as many of them as you'd like.

VanSkoik heads the Soil Conservation District at Poultney, Vermont, and is also a practical home gardener on the side. Instead of trouble from his garden, he wants food—as much as he can get. And here's the tip he slips a farmwife after talking fields and pastures to her husband.

When your garden's ready in spring, mark off a strip into five 3-foot-wide rows. Into the first two, sow seed for early growth, to suit your taste. Van Skoik plants radishes, lettuce and early beets in row 1, and early peas in row 2. Leave the third row empty for the time being. In row 4, he plants another pea row. Spinach and scallions go into row 5.

While they're starting, he's working plenty of composted manure into skipped row 3. When frost danger is ended, toward the end of May, he sows this row with hills of cucurbits. They're slow starters and he can cultivate them with the rest of the garden.

Photo: Eleanor Gilman

Toward the end of July, their vines start getting ambitious. But no harm's done because by now those early-crop rows on both sides are being harvested. From now on, instead of the row where they started, the cucurbits have a band over 18 feet wide along which they can sprawl to their heart's content.

garden calendar

(*Continued from page* 18)

must have spent blooms removed to keep them producing. Cut off scraggly growth for appearance's sake.

• Continue to pinch tops out of chrysanthemums for bushier plants.

• Now is the time to gather your herbs; the tender growing tips are at their best just before the flowers open. Tie them in small bundles and hang up, somewhere out of dust, sun and wind. When dry they can be crumbled into jars and covered tightly. These herbs are highly prized as gifts.

• Sow seeds now for winter crops of cabbage, broccoli, Swiss chard and Brussels sprouts. Try caulicab, an interesting new vegetable originated in the Northwest and easily grown here.

• Sweet corn, carrots, pole beans, and heat-resistant types of lettuce may still be sown this month.

• Raise the mower cutters if you are cutting your grass less than 1½ inches. The higher foliage helps to protect the root areas.

• Prune flowering shrubs which have completed their bloom for this season. Shape the bush and remove old wood.

• Keep dead flower heads picked off azaleas, lilacs and rhododendrons. This keeps the strength of the plant from going into seed pods and leaves room for the new flower heads.

• Composting should be going along at top speed this month. Lots of material from our yards, gardens and kitchens is available, but try to find another source, such as vegetable clippings from your grocery store. They are free and a worth-while addition to your heap.

the south

Brent Senay, Georgia

• It's time now to replenish the mulch around shrubs and perennials; apply to garden and flower beds around new plants.

• Cut or pinch off blossoms that have passed their peak in order to prevent them from going to seed. This will prolong the blooming season.

• Sink pots of houseplants in the garden for healthy growth and to cut down on indoor work.

• Do not attempt to water the garden and lawn by spending a few minutes each evening laying the dust and cooling yourself. This does more harm than good by bringing the plant roots to the surface in search of moisture. The correct method is to use a sprinkler or porous hose and leave it in each spot for an hour or more. This allows the water to penetrate and should not be necessary but once a week during droughts. *Mulch!*

• Make a four inch soil dam about shrubs and trees planted last winter; fill with water every week and after watering replace mulch to keep the ground moist.

• A second planting should go in now of bush and pole, snap and lima beans.

• Collards, corn, cucumbers, okra, squash, New Zealand spinach, turnips, crowder and black-eyed peas may be planted now.

• Plant eggplant, pepper, sweet potato and tomato plants now.

• Start broccoli, cabbage, cauliflower, celery and lettuce in coldframe now for fall crops.

• Quick growing flowers like balsam, globe-amaranth, portulaca, zinnias, petunias, nicotiana, cosmos and marigolds may still be planted for fall bloom.

• Bigger phlox heads will result if you reduce the number of stalks. Feed well with compost and supply plenty of water to roots. Water on the foliage will cause mildew.

• Transplant palms, bamboo and yuccas in lower South. Settle each at its former level, water thoroughly and apply a three inch mulch. Stake in windy areas.

(*Continued on page* 35)

practical pruning . . . Part III

Fruit Trees

LOREN D. TUKEY, PA.

Asst. Professor of Pomology,
Pennsylvania State College

Third in a valuable series offering clear information to the average gardener on this important phase of tree and plant care

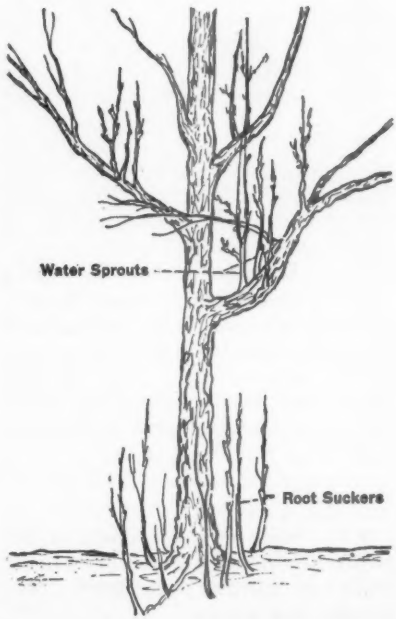
Branch of Pear with fruit spurs and blossoms

Pruning a fruit tree is like the story of the mechanic who was asked to itemize his bill of $7.00 for making repairs to a machine. All the mechanic had done was to hit the machine twice with a hammer. He replied that each hit with the hammer cost $1.00, but knowing where to hit $5.00. In pruning it isn't the cutting operation that is difficult, but rather knowing *where* to cut.

Generally, pruning is considered as being a winter or early spring operation, when the tree is dormant and void of leaves. At this time of the year the framework of the tree and the branches are easily distinguished. The best time to prune a fruit tree is during the months of March and April. However, pruning can be done as late as blossoming without serious results. Summer pruning should be limited only to the removal of watersprouts and broken limbs, since pruning during this season of the year dwarfs the tree more than during the dormant period.

A watersprout is a vigorous shoot that develops from the older limbs, primarily in the center region of the tree. They grow straight up, resembling a whip. These sprouts harbor insects and if not removed may interfere with the framework of the tree.

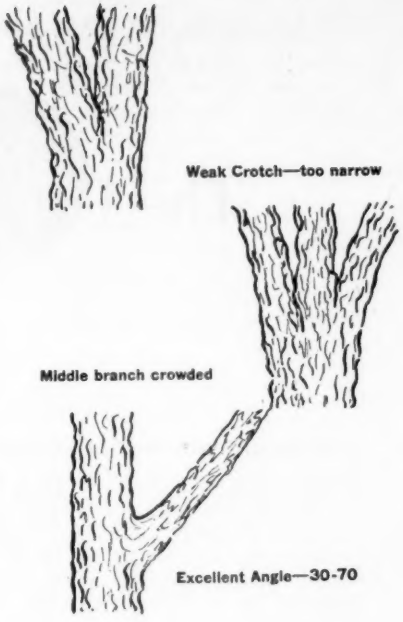
Pruning is also done at the time of planting regardless of the season of the year. This pruning is largely a training operation and a very important one.



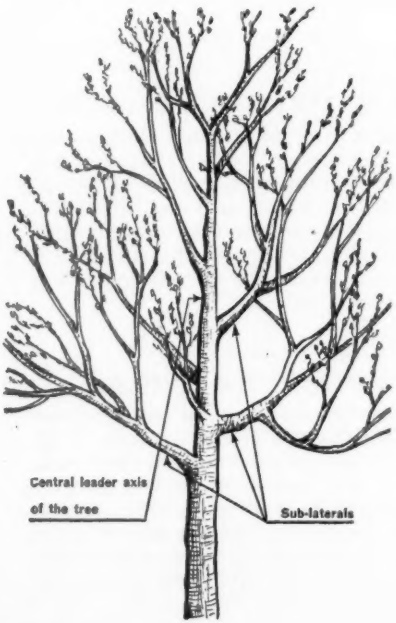
principles in pruning a developing tree

The central stem of a young tree is known as the main leader, or trunk in the case of an older tree. A stem possessing leaves is known as a shoot while a stem void of leaves is a twig. A branch is a group of connected shoots or twigs arising from a limb or another branch. A limb is an enlarged lateral branch of the main leader or trunk.

Pruning commences at the time a fruit tree is planted and continues annually until the tree is removed. During the first few years pruning is primarily a training operation directed toward establishing a strong tree framework. Pruning during the bearing years consists of removing weak wood, thinning the branches, controlling height and width, and repairing damaged limbs.



The framework of a tree consists of several branches growing laterally from the main leader of the tree at more or less definite locations. Usually one or more of the lateral branches is chosen at planting with two or more years being necessary to complete the selection. In choosing the laterals, there are distinct procedures to follow. The main lateral branches should be spaced at definite intervals on, as well as around, the central leader. This is done for a precise reason: so that no one lateral is close to or directly above another. Under the bark of the tree is a system of pipes that carry water and nutrients from the roots to the leaves and food materials from the leaves down to the roots. Each branch has its own pipe system connecting the roots and the leaves. By arranging the lateral branches as has just been indicated, each branch will have its own unrestricted pipe system.



From a structural standpoint the weakest part of any tree is where the

(*Continued on page 54*)

The Organic World

RECOMMENDS SEWAGE-SLUDGE TO HALT DEPLETION OF SOIL

Emphasizing the need for a high organic content in our soils, farming writer Bill Moshier in a Sunday edition feature article in *The Seattle Times* of February 15, 1953, called attention to the need of harnessing sewage-sludge as another aid in the task of saving soil. Terming sewage organic matter which properly handled is of untold value, the author deplored the many improvidences which he states "can reduce the nation to the same poverty that has overtaken earlier empires of soil wasters." He recommended that rather than the continuation of many present disposal methods which are a public health menace and a waste of rich organic matter, communities establish the means for making sewage-sludge available as fertilizer which improves soil, speeds growth and increases nutritionally high yields.

CHEMICAL FERTILIZER POISONING BLAMED IN DEATH OF CATTLE

Fourteen registered Hereford cattle of a herd of eighteen died within two days of grazing on a pasture where nitrate of sodium fertilizer had been applied. According to the *Rogers* (Arkansas) *Daily News* of March 13, 1953, all 18 cows, belonging to Aubry and Gordon Long of Bentonville, Arkansas, became so violently ill shortly after the application of the chemical fertilizer to the field, that despite the prompt arrival of a veterinarian, only four of the herd could be saved by the administration of antidotes. The loss financially was estimated at $3,500.

BRITISH COLUMBIA GARBAGE-TO-FERTILIZER PROJECT

Vancouver businessman C. Hopkinson has initiated an experimental agreement with the city of Vernon, British Columbia, to take over garbage disposal, and by bacterial processes convert waste material into rich, useful organic fertilizer for Okanagan Valley farms and gardens. According to *The Annapolis Valley Post Road* of November 19, 1952, Vernon municipal engineers were pleased that the plan would not only save the city money, but also that the method retains valuable properties which are partly lost in other systems or, of course, completely lost in burning garbage.

LADY BALFOUR TERMS ORGANIC METHOD KEY TO HEALTH

Lady Eve Balfour, during a recent speaking tour of the United States, repeatedly described the organic method of farming as the key to a healthier human race and a more productive agriculture. Addressing groups interested in the organic approach to soil, nutrition and health, the renowned British lecturer and author of *The Living Soil* called for a return to the basic law of nature—the law of returning to the earth the waste materials which come from the earth to complete the life cycle. At one engagement, reports the *Richmond Times-Dispatch* of February 19, 1953, speaking before an audience of horticulturists, scientists, gardeners and farmers at the University of Virginia, she emphasized that people who eat products of depleted soil never achieve their potential maximum health because such plants are inevitably deficient in food value.

EXPERT CITES INSECT DISEASES AS PEST CONTROL

Biological control of destructive insect pests is developing an important new aspect. Beyond seeking the benefits of a true balance of nature and introducing natural predators and parasites to curb injurious species, entomologists are now perfecting methods of employing insect diseases in the war on plant life enemies. United States Department of Agriculture's David G. Hall, writing in the February, 1953, issue of the *American Fruit Grower* states, "The most hopeful biological control possibility on our fruit insect control horizon may lie in the practical use of certain insect diseases. This is a radically new approach to the problem, being only a few years old."

DDT USE PRODUCES SPRAY-RESISTANT RED SPIDERS

Declaring that a tremendous increase in red spiders has accompanied the widespread use of DDT, Dr. Cynthia Wescott told a session of the Wellesley College Alumnae Council that few people realize the complications that have come with the introduction of new chemicals. Dr. Wescott, as reported in the *Boston Sunday Herald* of February 15, 1953, indicated that more than 45,000 economic poisons registered with the Department of Agriculture are specifics designed to kill just one insect, while another, closely related pest survives. Furthermore, she added, the miticides developed to squelch the red spiders not only proved toxic to human beings, but also resulted in producing a strain of the injurious insects resistant to strong poisons.

INSECT SPRAY KILLS CALIFORNIA YOUNGSTER

Four-year-old Robert Loomer died recently in the Menlo Park suburb of Palo Alto, California, a victim of what was called a common garden spray. Reporting the tragedy, the *Palo Alto Times* of March 14, 1953, indicated that the boy did not drink the poisonous insecticide, but had had some of the contents of a bottle of it spilled on him. He was dead on arrival at the hospital to which he was taken. (These hazardous chemicals are, of course, sold complete with plentious cautions regarding their safe use; yet the organic method—and increasingly more scientists, gardeners and agriculturists believe that sensible, natural biological control measures make these risks and deaths unnecessary.—Ed.)

growing asparagus from seed

A practical guide for raising, cultivating and caring for a healthful vegetable that should be a must in your garden

MARILYN NEUHAUSER, N. J.

It is no secret that starting an asparagus bed is an investment in good eating. Freshly cut shoots from the home garden surpass asparagus detoured through distributor and storekeeper. Easy freezing of asparagus makes possible all year enjoyment of this delicious vegetable.

Usually the aspirant to an asparagus planting is advised to buy roots or crowns of one or two year plants. This we did for several years. At the same time we started plants from seeds. Each year our organically grown plants did better than top-grade nursery roots. Now, for economy as well as results, we grow our own plants. It even appears that the seed-started plants may catch up with the older stock, having the advantage of direct transplanting as well as organiculture.

Growing asparagus plants from seed is no more difficult than raising any other perennial plant. Seed should be planted very early in the spring in rich non-acid loam, well-conditioned. A packet of seed should produce about 100 good plants, the amount recommended for a family.

While it is best to plant in the very early spring, seeds may be planted as late as mid-April. In fact, I would plant in June rather than lose an entire year. The resulting roots would be smaller. Seed may be sown either fall or spring, but spring sowing is preferable in northern latitudes. If fall planting is done in the South, one must plant where spring rains do not wash plantings out, as happened to me in the southern Smokies. Perhaps more important than season is the quality of seed. Also, the ground of the seed-bed should be well-drained, fairly retentive of moisture and high in humus.

If sown as early as possible, seed is planted one inch deep in 16 inch rows. Later, drier conditions call for 1½ inch or more sowing depth. The earlier the planting, the better for good germination as well as a full growing season. As the seed germinates slowly—in about four to six weeks—it is urged that a few radish seeds be sown as markers. Soaking the seed 24 hours in tepid water hastens germination and is a necessity in dry weather.

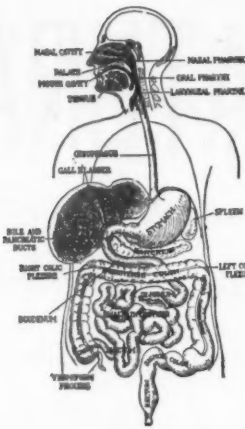
Care is needed to keep the young plants free from grass and weeds. As soon as the needle-like seedlings emerge, hand-weeding as well as cultivation or mulching between rows is called for. Although much can be done with a garden cultivator, hoe, rake or prong hoe, some hand-weeding is requisite. Thinning to three inches follows when plants are started well. When about three months old and 10-12 inches high, the young asparagus are thinned to six to nine inches.

When a year old, plants are moved to a permanent bed. Although spring planting is the rule, we experimented with fall planting this year, avoiding the long wet spring delay. Results are yet unknown.

(*Continued on page 40*)

This Is Where LIVING POWER Begins!

THE DIGESTIVE TRACT



Have you ever considered that your body is actually a *machine?* Like any other complex mechanism it is subject to fatigue, wear, damage. It can be harmed by strain, overwork or neglect. Likewise it responds surprisingly well to careful use and periodic "check ups."

The "power plant" of your body is *the digestive tract.* Here the food you eat is converted by body juices into various "fuel" substances for your system. Next that "fuel" is absorbed in the tract and delivered to the different tissues where it is assimilated... for life and energy. In this way the body utilizes the "living power" of your food. Meanwhile the remaining bulk, the valueless wastes, are carried off by the excretory organs.

Perhaps you have noticed that digestive upsets and irregularity seem to go together. It is easy to understand why. Let trouble develop any where "along the line" and the whole digestive tract is soon affected. Difficulties in the digestive tract invariably lead to disturbances elsewhere in the system. Therefore, it behooves men and women over age 35 to pay special attention to this "lifeline" of their bodies.

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Take just one of these Minerals for example . . . *Calcium.* It is a known fact that the body requires the continuous presence of calcium in the blood. Without adequate Calcium the blood cannot clot readily when you cut yourself. Nerves and muscles nourished by the blood keep calling for Calcium. It is known, too, that your blood will seek to maintain the needed percentage of Calcium . . . even if it must drain other tissues of this essential Mineral. It is possible for this to happen without any immediate danger signal . . . thus leading to "hidden calcium deficiency."

One serious aspect of this bodily need for Minerals is that today's "mass production" agricultural techniques often rob the soil (and the food it produces) of Minerals. Another factor is that today almost all the vegetables and fruits we eat are cooked . . . instead of eaten raw. Modern cooking and preserving methods often rob our foods of precious minerals . . . especially Iron, Calcium and Phosphorus.

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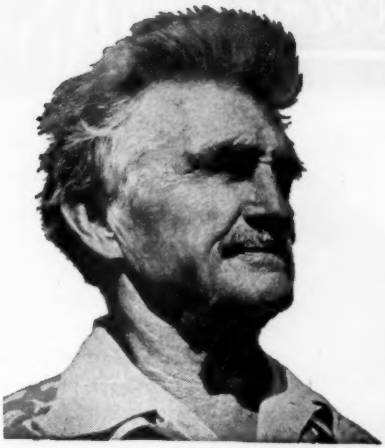

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garden calendar

(*Continued from page* 25)

• Azaleas, magnolias, jasmine, tea olive, camellias, climbing roses and many other plants may be layered now. Bend a branch down to earth and cut or crack it near a joint. Cover with thin layer of good soil and place a rock on limb over the joint to hold it down. By next spring you will be able to sever the rooted plant from its parent and transplant.

• Remove suckers—sprouts between branches and main stem—regularly from your staked tomatoes.

• When Iris has finished blooming large clumps may be dug, separated and replanted anytime from now 'til fall. Inspect carefully for borers and cut out and remove from bed any damaged or rotted parts. Use compost well-mixed in iris bed and plant rhizomes just under the surface. Do not mulch as this will cause rot.

the southwest

Charlotte Hoak, California

• Collect and dry all vegetable waste. Make compost every 30 days by the dry method.

• Top mulch all plantings to conserve moisture, save labor in cultivation and to keep the weeds down.

• Plant in deep, well-prepared holes your well-established plants of tomatoes, eggplant and peppers. Put compost in the bottom of the holes and sink water down before planting.

• In small gardens use climbing Chinese cucumbers and the Armenian one, Hirta.

• Put in black Italian zucchini and yellow Patty-Pan bush squash. The new Uconn squash and Vaughan's bush pumpkin are prolific bearers.

• In deep, well-prepared soil plant okra, lima beans, bush and pole beans and corn. Mulch heavily and water with soil soakers.

• Plant summer cover crops of drought-resistant legumes such as Tepary and Black-eye beans. Plowed under later as a green manure, they help renew the soil.

• Put lettuce for summer in partial shade. Bibb, Slobolt, Oak Leaf and Salad Bowl do not get bitter in summer. Great Lakes is a rapid grower.

• Sow such annual herbs as dill, summer savory and sweet basil in your herb beds. Keep parsley, evergreen garlic, French sorrel lush and growing for your green salad bowl.

• Set citrus trees and semi-tropicals. Use dwarf citrus fruits such as Meyer lemon, Rangpur lime and dwarf oranges in large redwood containers.

• In flower gardens plant the heat loving annuals: cosmos, marigolds, annual gaillardias, dwarf Tithonia, annual phlox and petunias.

• Water spring bulbs until the leaves die down and feed with a mixture of flour bone meal and compost.

• Set hardy chrysanthemums in permanent rows in well-prepared soil. Mulch heavily and water lightly during the summer.

• Plant more bulbs now; tigridias, tuberoses, and daylilies take little water.

• Follow the summer care of camellias the organic way. Remove old mulches and apply new ones made of snow-line leaf mould mixed with equal portions of well-rotted cow manure and compost. Water carefully.

• Keep your pH low, mulch and compost continually. Add minerals and humus to over-used and poor soils. Cultivate little, keep the weeds down, use flat culture and water economically and you will have a garden which weathers the long dry season.

• Let earthworms help soil fertility and aeration everywhere possible.

the nutritional diseases that grow out of the soil

Reprinted from "The Cattleman"

DR. J. B. JOHNSTON, TEXAS

Texas Livestock Specialist

Health for our livestock comes from the soil. This fact is self-evident when it is pointed out that all our feedstuffs come directly from the soil in the form of plant products.

Fifty to one hundred years ago this was no problem in America because our soils had these minerals in abundance, and so of course did the plants grown from them and the animals that fed on the plants. But repeated and long-continued cropping has largely wiped out these reserves, except in the newer lands of the West.

Widespread crop failures are a danger in this country unless farmers turn under more humus, feed the trace elements, as well as the calcium, nitrogen, phosphorus and potassium fertilizers.

Since the arrival of mechanized methods of farming the average farmer has less animal manure for fertilizing his land. To keep his yields big, he covers his fields with chemicals.

Up to a few years ago every one considered cobalt just another ore that miners dug out of the ground for use in industry. They did not know that it was an important food element all mixed up with vitamin B12, cow manure, and the famous animal protein factor we hear so much about. Cow men had their tussle with this element a few years earlier. On certain lands cattle became anemic, lost weight, dropped in milk production, and in general went to pieces. No disease germs were found. Not even a virus. The solution finally turned out to be the addition of a tiny pinch of cobalt to their feed.

If cobalt, just one of dozens of rare mineral elements ignored a few years ago, now turns out to be so important to the health of our livestock, just what might be the significance of the dozens of other trace minerals whose secrets are now being unraveled with the spectograph.

Healthy soil is full of organic matter, a variety of major and minor minerals, millions of microscopic organisms and plenty of earthworms. If our livestock could eat grains grown upon such soil it is quite possible that they would get in natural form all the minerals, vitamins and antibiotics they need for perfect health. Otherwise they have to be supplied artificially in increasing quantities in our feedstuffs —if our livestock are to maintain the best health.

With the various adaptations of the principles of the spectograph, it is possible to determine quickly nearly every element in any sample of soil, food, feed, meat, manure, urine, or fertilizer. A complete knowledge of the elements present in healthy plants and animals, as well as in unhealthy ones, can give us information never before available on how to keep plants and animals in perfect health.

There is also the feeling on the part of many people that since the human race has for centuries eaten certain staple foods produced on our farm soils, and maintained a reasonably satisfactory state of health, it can do

the same thing today. Those who hold this belief try to ascribe the growing rate of degenerative diseases, such as those of the heart, liver, teeth, bones, etc., to causes other than the quality of food.

Many others, however, have become alarmed at the increasing indications of a falling level of national health. These men point out a much higher percentage of military rejections in World War II as compared to World War I; to a greatly increased percentage of hospitalization of the general public; and to a marked rise in the incidence of degenerative diseases, which brings about the need for more hospitals and insane asylums.

For many years, not only in this country but in others, there have been farmers and scientists who recognized the shortcomings of the NPK formula. Their own observations and experience convinced them that really nutritious food or feed cannot be produced from deficient soils, even though they might be liberally supplied with calcium, nitrogen, phosphorus, and potash. Such men have made various attempts to improve the health-giving qualities of soil products. Some rely upon adding bacteria-rich humus formed by composting. Others depend upon the addition of numerous minerals. Building up the earthworm population is believed by many to release more minerals from the soil particles.

For many years, Dr. Ira Allison, 155 Public Square, Springfield, Missouri, has been interested in the treatment of nutritional diseases. Over the years he became more and more convinced that a good many of the diseases of modern man are based, primarily, on malnutrition. And a great deal of that malnutrition he was certain was peculiarly enough a "starvation-on-a-full-stomach" type. In other words, he believed that a man might literally be

(*Continued on page 57*)

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HYPER-HUMUS COMPANY
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20 Arkansas acres . . . and the Lempkes

(*Continued from page* 13)

grew to be about twenty four inches high; it was, however plowed into the soil in time for peas to be planted in the fall. They were, in turn, also worked into the soil. This practice was followed three years, and the third year the rye grew so tall it stood above the posts that support the wires and plants. That fall the peas grew so tall and heavy Mr. Lempke was unable to work them into his topsoil with his one-horse equipment, but had to get a neighbor to come in with his heavy tractor and disk to do the job. That year about a hundred dollars' worth of sawdust was hauled in to be used as mulch—mostly on the vineyard—and don't let anyone tell you it can be had for nothing. Truckers have to make a living, too! Some rock phosphate, wood ashes, and limestone were used to help soil fertility but Mr. Lempke stresses the fact they were used very sparingly. He feels that heavy applications are not required nor desirable. Much mulching and some sheet composting is being done at the present time to conserve energy and time for some other urgent projects such as putting up the fine new building just erected by Mr. Lempke, with son Lawrence's help, to be used as workshop, garage, and small living apartment.

Since only comparative evaluation has meaning for most of us, let's consider the results of this four-year period during which the organic method has been diligently applied on these 20 acres. Always there's cause and effect—the means to an *end*—so in this project there's cost. It can be summed up thusly: brains, brawn, time, and a modest outlay of capital. The reward? Immense benefits on an

expanding horizon, according to the Lempkes. Of first consideration to most of us is that gnawing item of dollars and cents. So, current dividends are: practically all of the family's food supply plus some market surpluses. In 1952 they had wheat and rye for cereals and bread; the best of fresh vegetables such as asparagus, potatoes, onions, beets, squash, corn, tomatoes, okra, and yams for summer use and for winter storage. Berries and grapes were produced on a larger scale and considered cash crops, although both are used generously by the family, as are apples. Notwithstanding long hours of work and the necessary regularity of chores, the program also includes the important segments of eggs, meat, and dairy products for family use and market surpluses.

Benefit number two is that factor of family health. Actually, it's the key to the whole experiment. No absurd claims are being made in that field, but so appreciative are they for genuine measurable progress that it gets frequent discussion, and from various angles. To even a casual observer, the difference stands out in the smiling eyes, the unbounded vim and pent-up "steam" of the young ones. Gone from their daily lives are the gnawing constant nuisances of skin irritations, headaches, styes, poor appetites and indigestion. Gone also is that shrunken morale one feels in falling short of projected goals. In its place is discernible, earned dignity at having an honest conviction verified. So, while the great drought of 1952 wrought immeasurable hardships, it unquestionably afforded evidence to a group of interested individuals that the organic method is superior. The Lemkes have again proved the old adage: "It's an ill wind that blows nobody good!"

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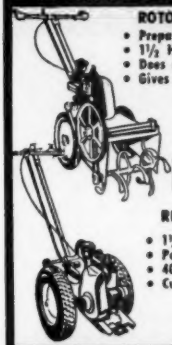

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BOOK REVIEWS

Our Garden Soils by Charles E. Kellogg. 232 pages, indexed. The Macmillan Co. $4.00.

This volume, written by the Chief of the Division of Soil Survey, U.S.D.A., is one which should be in the possession of everyone who works the land, whether for pleasure or for profit.

In understandable language the author unfolds the complex knowledge of soil science in such a manner that it may be applied to problems on your own land. Some 38 pages are devoted to the soil preferences of plants, and this section alone is worth the price of the book. A chapter, "Organic Matter: The Gardener's Elixir" is an excellent contribution to organicultural literature.

growing asparagus

(Continued from page 30)

Occasionally, seed is sown directly where plants are to remain. Growing asparagus without transplanting is cheaper, easier in some ways and saves transplanting shock. Direct seeding results in the green shoots of surface planting. The older trench method produces more white stalks especially with deep cutting. With direct seeding, intercropping of the rows may be practiced in the three by five foot spaces. Care must be taken to retain fertility, however.

Pros and cons of the trench and surface methods of growing asparagus have been discussed in *Organic Gardening* in previous issues. The surface method seems to be worth trying. If plants are cultivated rather than mulched, surface shoots may be broken off. A deeper planting can be disked or cultivated over the entire area to

get rid of early weeds. With trench planting, crowns are covered with only two inches of dirt when set out. Later the furrow is filled in, as the plant grows.

Whether trench or surface planting is used, it pays to plant in relatively rich, weed-free land. (These mistakes were made by us, in our impatience to start.) Good preparation and site selection pays, since the bed produces 10, 20 or even 30 years if well-maintained. Plant the future permanent bed to other crops a few years if only sod land is available. Being a heavy feeder and needing available nutrients quickly for tender growth, asparagus land must be well limed as well as quite fertile. Compost is recommended, and is a necessity for heavy clay soils which hamper the far-reaching roots. Ideally south, open exposure with some northwest protection is recommended. Plants are often set one foot apart in three foot rows, but wider planting up to six by six feet is found more and more commercially. Small garden owners write of successful mulched surface planting in 18 inch rows.

Harvesting of spears should wait until the third year, and then lightly for a few weeks. Harvest from flourishing plants is plentiful the fourth year and on. Cutting here in west central Jersey ends about the first day of summer. In New England, Independence Day is set usually as the last day of cutting. Actually, we snap rather than cut our asparagus, taking just the tenderest parts for use or sale.

After harvest season feathery tops are allowed to grow, storing food for next spring. In the fall the drying tops are cut to ground level. By this time the scarlet seed-bearing berries have matured. Letting them go to seed in the bed may produce a mass of seedlings which would crowd the bed if allowed to develop. Therefore seeding is prevented by cutting the stalks or the pods.

Can these seeds be sown to raise plants? If very carefully selected from vigorous parent stock and sorted out for large, fully developed seed, they may. However, it is usually advisable to buy seed from good dealers to insure uniformity of the individual plants.

Should the gardener wish to try seed-saving, the cut stalks are hung up safely to dry. The dry seeds are hand-stripped or threshed, soaked in water a day or two, then rubbed or smashed to break the outer shells. Seeds and pulp are separated by wash-

(*Continued on page* 59)

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MAC ENGINEERING CO., Lewisburg, Pa.

with the editor

(*Continued from page* 11)

But let us proceed with the subject opened up by Dr. Wilson, and explore further the effects of too much nitrites in plants. Evidently this subject is not a new one. Wilson mentions another group of men (Gilbert, Eppson, Bradley and Beath) who in 1946 published a paper sponsored by the Wyoming Agricultural Experiment Station (Bulletin 277) which stated that analyses of plants were made for their contents of nitrate and re-emphasized the effect of this material on human health, as did Wilson himself in 1943.

I came across an item in the *Journal of Economic Entomology* (Vol. 44, No. 6, page 904) and will quote it:

"A preliminary test indicates that the nitrate composition of plants increases after treatment with OMPA.* This increase in nitrate compounds in plants has had some practical importance in the case of 2, 4-D (Stahler & Whitehead) since cattle and other ruminants feeding on plants having a high content of nitrates may have a bacterial conversion of nitrate compounds to toxic nitrite compounds. A nitrate concentration in edible plants which exceeds 1.5 per cent may result in livestock poisoning. The nitrate composition of the soil of our experiments was very low."

Wilson goes on, "Recently, Weart, working as a sanitary engineer in Illinois, drew attention to a new disease called *infant Methemoglobinemia* which was said to be due to too much nitrate in the drinking water. In Illinois alone 33 cases of the disease with five deaths were reported in 1947. A maximum safety limit of 10 parts of nitrate per million of water has been set by certain authorities." This is self-explanatory. Let's go a bit further in Wilson's article:

"The nitrate content of any food is a direct measure of the potential amount of nitrite that may appear,

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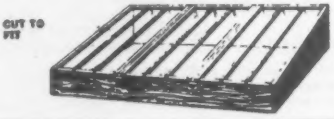

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and the toxicity that follows will depend on the rapidity of the reduction. The data in the tables may be used as an indication of what may happen. In Table I, is given the nitrate content of green vegetables grown at Ithaca, N. Y. It can be seen that only tomatoes contained no nitrate and that 7 of the 14 vegetables contained at least 1,000 parts per million in the juice. Broccoli, cabbage and cauliflower were found to contain 1,000 parts per million or more in their juice and rhubarb contained as much as 5,454 parts per million:

TABLE 1

	Nitrate parts per million
Beets	1,333
Broccoli	785
Broccoli	3,846
Cabbage	2,222
Carrots	442
Cauliflower	2,000
Celery	1,212
Cucumber	121
Lettuce (head)	1,250
Lettuce (curly)	870
Muskmelon	433
Rhubarb	5,545
Rhubarb	1,000
Tomatoes	0
Watermelon	100
Watermelon	1,000

Table 2 contains analyses of nitrates found in the juice of green vegetables and quick frozen foods for sale at Ithaca, N. Y., in May, 1948:

TABLE 2

	Nitrate parts per million
Asparagus	50
Cabbage	1,200
Cabbage	186
Carrots	325
Carrots (diced, quick frozen)	181
Celery (Fa)	1,240
Celery (pascal)	3,232
Lettuce (curly)	1,818
Lettuce (head)	400
Potatoes (new)	63
Rhubarb	1,818
Rhubarb	4,545
Radish	303
Radish	1,176
Spinach	300
Spinach (plant 1)	2,353
Spinach (plant 2)	1,600
Spinach (plant 3)	2,000
Spinach (quick frozen)	3,636

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In Table 3, nitrate content of strained baby foods obtained on the market was determined as follows:

TABLE 3

	Nitrate parts per million
Green beans	37
Beets	333
Beets	750
Carrots	3
Carrots	0
Peas	0
Spinach	616
Spinach	833
Squash	0
Squash	0
Vegetable soup	37

With regard to the above Table 3 Wilson says: "The variations in nitrate content of certain vegetables can be seen also from the data listed in Table 3. One sample of strained beets labeled baby food contained 333 ppm, whereas another contained 750 ppm. Likewise, a sample of spinach contained 616 ppm, whereas another contained 833 ppm. This is taken to mean that the nitrate content of any vegetable will vary, perhaps, depending on the amount of nitrate that is accessible to the growing plant."

I am submitting herewith the next five paragraphs of Dr. Wilson's article word for word:

"The data presented in this paper record the content of nitrate in many vegetables and vegetable foods that are consumed by humans and carries the idea that each ion of nitrate that was found is a possible source of nitrite that is about ten times more toxic than the nitrate from which it came. If the nitrate ions were not reduced to nitrite, little or no concern should be felt about its concentration in foods or drinking water. Because an unknown quantity of the nitrate may be reduced to nitrite, these data should be of timely importance.

"It is apparent from the data that probably most succulent leafy vegetables contain some nitrate in their juice and this is present very likely

in proportion to the quantity that was available to the growing plant. The edible parts of spinach, rhubarb, cauliflower, turnips, and cabbage may contain in their juice at least the equivalent of 15,352 ppm of potassium nitrate, which is equivalent to approximately 9.4 per cent of the dry weight. As much as 10.2 per cent (1) and 11.1 per cent (2) of the dry weight of spinach and turnips respectively have been reported. This nitrate may be carried with the leafy material and appear in fresh vegetables from the garden, in those offered for sale on the market, or in strained baby foods. Such quantities may be larger if the vegetables are allowed to wilt some before they are analyzed or if their moisture is spontaneously reduced when the plants are in the field. Many other factors can operate to modify this content of nitrate (1,2) and data indicate that the fruit contains much less nitrate than supporting tissues carry (5). This may be true particularly of tomatoes, squash, ears of corn, green peas, and similar foods. These quantities of nitrate are paralleled by similar quantities in numerous other plants. Mayo (3) reported that potassium nitrate represented 25 per cent of the dry weight of certain samples of corn stalks.

"Weart (4) reported cases of hemoglobinemia in infants caused by nitrate in the drinking water and suggested the maximum safety limit of 10 parts of nitrate nitrogen per million parts of water. He pointed out that doctors in Illinois have been advised not to prescribe feeding formulas involving water unless the nitrate content of the water is known to be within this limit. If the formulas contain vegetables such as those analyzed and reported on in this paper, it is clear that the nitrates of such vegetables as spinach, lettuce, celery, turnips, and certain others may be far more potent in producing hemoglobinemia than that of the drinking water. Certainly

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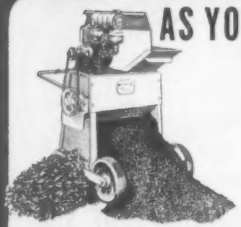

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the nitrate in the vegetables would augment that which may be present in the water. It may be suggested that in some cases the nitrate in the vegetable foods may be solely responsible for this ailment of babies and may cause other disturbances not now properly diagnosed, for the nitrate may be 200 times stronger in such foods than that which was set as the safe standard for the drinking water.

"More data are needed to appraise properly the effect of nitrate in foods on adults. It is well known that nitrate in feeds is associated with cornstalk disease, oat hay poisoning, borna disease of horses, grass tetany in cattle, and bloat in certain types of animals. Animals that ingest feed containing toxic but not lethal amounts of nitrate may abort the forthcoming offspring. Feeds that contain 1.5 per cent of potassium nitrate were known to effect such a result although few grass symptoms in the mother were observed (2). Calculated on the dry basis, several foods listed in this paper contained as much or more nitrate than that present in feed which was injurious or lethal to animals.

"If it is assumed that 1 gram of potassium nitrate ingested at a single meal is toxic, a basis is available for evaluating the effect of nitrate on human adults. Using the findings recorded in this paper it would be necessary to ingest only 3.9 ounces of rhubarb to get a toxic quantity of nitrate. If one uses the findings of other workers and makes similar calculations, about 2.3 ounces of spinach, turnips, or certain other vegetables would supply the toxic quantity. The present practice of applying large applications of nitrate of soda to crops in order to produce succulent material with a bright green color and to obtain heavier yields may be responsible in most cases for the high content of nitrate in these foods."

Then Wilson sums up as follows:

"Leafy vegetables, frozen foods, and

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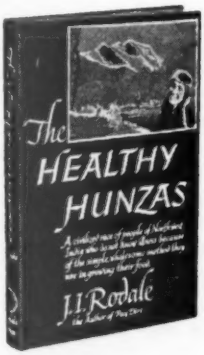

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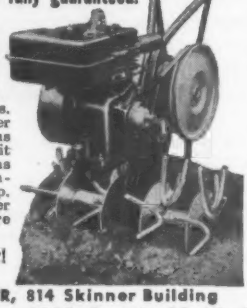

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prepared baby foods were analyzed for their content of nitrate. From the findings it is suggested that the nitrate in such foods may contribute to hemoglobinemia found in infants and may produce certain toxic, if not lethal, conditions in adults. The high content of nitrate in the foods may be attributed in many instances to the application of nitrogenous fertilizers, especially nitrate of soda, to the growing crops."

These findings are of extreme importance to vegetarians who usually depend so much on leafy foods. According to these figures they should eat such foods as carrots, peas, potatoes, squash, green beans, cucumber, muskmelon, tomatoes, corn and sunflower seeds in preference to too much of the leafy foods. We have always been against rhubarb, because it also contains too large a quantity of oxalic acid which is used as a chemical bleach for straw hats. Spinach contains also a significant amount of oxalic acid. This is especially bad for people with kidney and urinary complications.

The publication of this article opens up the need to experiment and to see whether the nitrates in organically produced foods are more stable and keep their nitrate form without turning to nitrites. The fact that there is so much evidence that people who eat organically produced food become healthier would seem to indicate that this is so, but it must be checked and it will be, I hope, soon.

Another trouble with nitrate of soda fertilizer is that the plant tends to absorb the nitrate but not the soda which pollutes the soil and forms the chemical equivalent of washing soda, which we know to be quite caustic. It hardens the soil and eventually makes it extremely difficult to cultivate, but it tends to blow up the crop and increase the yield. Organic fertilizers usually have much less nitrogen than the synthetic commercial fertilizers and that has been one of the

contending points between the organiculturists and those of the artificial school.

The latter state that composts do not have sufficient nitrogen, that they might be satisfactory as a soil conditioner, but that the crop needs real, he-man fertilizer to really produce yields. It is admitted that composts usually have less nitrogen. Perhaps from the point of view of this new work, such deficiency may be conducive to the health of a person eating food grown with it.

In regard to this new discovery, which shows that leaves contain the most nitrates I would like to quote something that I wrote in *Organic Gardening* in the issue of March, 1945, in an article called "Seeds as Human Food":

"An experiment was performed where the effects of the use of a chemical fertilizer, superphosphate, was measured on a crop of alfalfa, in comparison with a similar crop on which no fertilizer was used. It was discovered that all the inorganic phosphorus of the fertilizer went to the stalk and leaves. The amount of organic phosphorus in both crops of seed was alike, because the seed rejected the inorganic phosphorus. Nature cannot build a good race of alfalfa plants by permitting too many minerals of inorganic origin, to find their way into the seed. The plant will forage about, and most of the 'organic minerals' or minerals that already had formed part of an organism are probably saved for the seed. If sufficient organic elements cannot be found, the plant will either produce seed which anyone can see is defective, or it will not produce seed at all.

"This is an extremely important point to be considered carefully. Those of you who are worried about having to purchase food raised with chemical fertilizers, should see to it that a certain portion of your diet consists of seeds, because the seed is not any-

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where nearly as much affected by the use of strong chemicals as the leaves or stalks, and contains thus significant amounts of organic elements."

In my book *Pay Dirt* I expressed the same idea (p. 126) as follows:

"A study made by Thomas H. Mather of the University of Alberta, Edmonton, shows that where superphosphate was used as the chemical fertilizer in a crop of various kinds of hay, 'practically the entire increase in total phosphorus . . . was confined to the inorganic phosphorus fraction.' There was no increase in the organic phosphorus of the plant. Experimental work is needed in this field, but there is much evidence available to show the great difference in the form of minerals that come out of a mine and those produced by green manure or composts.

"In the Journal of *Industrial Engineering Chemistry,* (Vol. 4, 1912) R. C. Collison in an article entitled 'Inorganic Phosphorus in Plant Substances,' shows that the seeds of plants contain more phosphorus in organic combination than the other organs of the plant. This is a method nature uses for the perpetuation of the species. The seed must have the most strength, and the most potency in order to be able to carry on into the next generation. And when there is a certain amount of organic mineral available, as much as is possible of it is conserved for the seed. When chemical fertilizers are used there is an insufficient amount of organic mineral produced to give the seed the necessary reproduction strength, therefore seed or plant strains die out."

These ideas harmonize remarkably with the nitrate theory of Dr. Wilson. Peas and corn, indicated by Wilson's work which have little or no nitrates, are seeds. Other seed foods are nuts, the grains and sunflower seeds. Incidentally, the seeds of apples contain a toxic substance and should not be eaten.

Well, this is indeed a happy day for organiculture. A governmental agricultural organization has unqualifiedly stated that there is some connection between the use of a commercial fertilizer and human health. I am not writing this in a spirit of I-told-you-so, but in a humble hope that governmental agencies throughout the land will take up this subject in which Dr. Wilson has pioneered.

Literature Cited

1. CAROLUS, R. L. The use of rapid chemical plant nutrient tests in fertilizer deficiency diagnosis and vegetable crop research. Va. Truck Exp. Sta. Bul. 98:1531-1556. 1938.
2. GILBERT, C. S., EPPSON, H. E., BRADLEY, W. B. and BEATH, O. A. Nitrate accumulation in cultivated plants and weeds. Wyo. Agr. Exp. Sta. Bul. 277:1-37. 1946.
3. MAYO, N. S. Cattle poisoning by nitrate of potash. Kan. Agr. Exp. Sta. Bul. 49. 1895.
4. WEART, J. G. New "Blue Baby" disease. Sci. News Letter, 53: No. 18, 275-276. 1948.
5. WILSON, J. K. Nitrate in plants: Its relation to fertilizer injury, changes during silage making and indirect toxicity to animals. Jour. Amer. Soc. Agron., 35:279-290. 1943.

(To be continued)

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design for dahlias

(Continued from page 15)

leaving only the center bud to develop. As soon as buds appear, branches will also appear at the base of each leaf on each of the four canes. These laterals are removed, leaving only the two nearest the base of the cane which will develop to produce the second crop of bloom. Cactus varieties may be grown to six or eight laterals and small flowering varieties need not be disbranched.

cutting and show preparation

Blooms should be cut in the late afternoon or very early morning and placed in deep water for at least three hours. Stems should be cut 15 inches or longer. After the bloom has been cut, remove the leaves on the stem except the two leaves next to the bloom, which are left in order that the bloom

will have foliage when exhibited. As soon as the bloom has been cut, place it in a container of water. Avoid crowding the blooms as the petals bruise easily. Exercise care to keep the foliage out of water. Place containers in a cool, dark place; the basement floor is usually the coolest spot. After the blooms have been hardened off in this manner they may be packed in boxes for transporting to the show room. When packing blooms, use a good quality of waxed florists' paper to keep the blooms from coming in contact with ordinary paper or cardboard which act as a blotter and absorb moisture from the flower and stem. If care is exercised in cutting and packing, blooms may be transported for great distances and remain out of water for a considerable period of time.

harvesting and storage

Following the first hard frost, cut the dahlia plants off just above the ground level. If the clumps are allowed to remain in the ground too long, new eyes will begin to grow; therefore, digging may begin about one week after the plants have been cut back. Use a spading fork for digging dahlia clumps, and begin by placing the fork in the ground to its depth about ten inches from the stalk. This process should be repeated until the ground is loosened all the way around the clump. Now, gently pry the clump loose with the fork and lift out by placing the fork underneath the clump. In removing the dirt from the clump, care must be exercised not to strain or break the necks of the tubers. Place the clumps on a lump of soil, as a support under the center, in order not to break any of the tuber necks. These clumps should be left to dry three or four hours in the shade before placing in storage.

After all moisture has disappeared, cut off the stems within three inches of the crown. A small fine-toothed saw is excellent for this purpose. The

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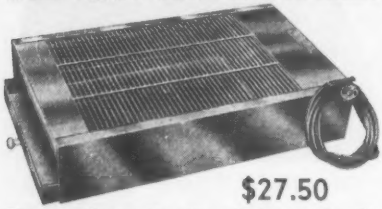

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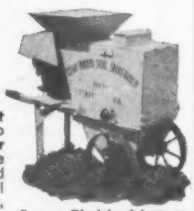

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clumps may be packed tightly together in boxes or baskets, using dry sand, vermiculite, or dry peat, as a packing medium. Sand is cheaper but either of the latter two makes containers much easier to handle. Place the containers in a cool, dark place in the basement where the temperature is from 42 to 50 degrees. Early in December remove the clumps from storage and inspect for stem rot, cutting away any decay that may appear. If clumps show signs of shrivelling, moisten slightly, and if packing medium is damp or wet, dry it out. Then pack as before. About April 15 remove the clumps from storage and divide them so that each tuber has an eye. Never plant a whole clump.

Whether for exhibition or not, though, the comprehensive color range of dahlias, embodying practically all colors and combinations of colors, and their beguiling blossoms themselves make this flower justly attractive to any gardener. Give them considerate, organic care—and they will give *you* bright, lively pleasure.

double purpose trees

(Continued from page 17)

these impoverished soils cannot contain all necessary elements to a maximum degree. Nut trees, however, draw their sustenance through their deep-growing roots, and undoubtedly secure greater proportions of these necessary food elements deep in the earth.

Here is a hint to all growers of plants. For success, copy nature. To be sure, plants have the power to

alter their habits through the years. They need that power to survive. But it often requires long stretches of time for a plant to become acclimated in a new temperature zone, or to tolerate soil conditions to which it is not accustomed.

Obviously, then, the organic method is best for nut trees. If you have a compost, or if you will make compost, you can dig it into the soil under your nut trees; and with continuous applications of compost the ground will become rich and loamy, like the leaf mold that every green-thumbed housewife prizes so highly when she pots flowers for her winter display indoors. Today, one can buy leaf shredders that quickly grind leaves to tiny fragments and so hasten decay. Spread on the ground, these shredded leaves are quickly reduced by action of frost, sun and rain to rich plant food. Gravity and earthworms will do the rest. Peat moss and sawdust and other materials that shield the ground and rapidly decompose also help to make the ground more like the leaf mold of the forest.

Such applications not only provide the natural food needed by all plants but tend to keep the soil underneath full of moisture. They keep it cooler in summer, thus protecting the plant roots. And the leaves, coming from deep-feeding tree roots, are rich in those food elements so lacking in most topsoils. Nut trees so fed will yield food that is greatly enriched in nutritive value.

It was not by accident that Nature devised the methods she evolved for providing fresh food supplies for her forest growths, and of keeping her soils constantly supplied with these foods. Back to nature is a good slogan for gardeners, and especially for those gardeners who wisely grow nut trees.

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practical pruning

(*Continued from page* 27)

upper side of a limb joins with the trunk, which is known as the crotch. The smaller the angle between the branch and central leader, the weaker the crotch. Thus, by selecting only branches with wide angles (60 to 90 degree), this crotch weakness is reduced, resulting in a stronger framework.

It is not uncommon to find a young tree that has had one of its branches develop into a leader similar to the central leader of the tree. If allowed to develop, this condition will result in a forked tree, structurally weak. Under the weight of a heavy crop of fruit, the tree is apt to split into two parts. This vigorous branch can be suppressed in growth by cutting off the branch just above the first good lateral branch growing toward the outside of the tree. This type of pruning is known as heading-back or suppressing growth, and may be applied to almost any branch. By cutting to an outside lateral, the limb is encouraged to spread out rather than to continue straight up, which would be the result of cutting to an inside lateral. If by heading-back, a branch is reduced in length to less than 30 inches, it should be removed in its entirety.

A condition may be found on a tree where several branches originate at the same point on a limb. This may appear as a fork or whorl. It is recommended that all the branches be re-

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moved but one. Usually the largest diameter limb is left.

A tree in its early years is like a young boy, very vigorous and a rapid grower. As the tree or boy ages, the rate of growth diminishes until the tree bears fruit or the boy reaches manhood. In succeeding years, growth is largely filling out, putting on a little weight. To a young tree, pruning is an invigorating process that tends to delay the time of fruiting. Consequently, prior to bearing as little wood as possible should be removed from the tree. By all means small branches and short stubby spur growth should be left. It is from this type of wood that the first fruit develops. Once the main lateral branches have been selected, pruning should be limited as much as possible, to removing broken limbs or correcting bad situations. The general tendency is always to over-prune a young tree.

Principles in Pruning a Bearing Tree

When the fruit tree has come into commercial bearing, the tree should be pruned every year to encourage the development of good-sized, highly-colored fruit. The way to prune a bearing tree is to start on the top and sides of the tree and work in toward the trunk. Detailed pruning, cutting many small diameter branches one-fourth inch and down with a pair of handshears, is very time-consuming. Generally a saw, loppers, or pole pruners are used to make bigger cuts from one-half inch and up. Limbs arising from the center of the tree that are smaller in diameter than the main lateral limbs and interfering with the branches on the main laterals should be removed or suppressed. It may be necessary to head-back some branches or eliminate whorls or forks as previously described.

The severity of pruning depends upon the kind of fruit. Very little

wood if any should be pruned from pear trees, but considerable wood from peaches, to encourage annual terminal growth of from 15 to 24 inches.

Pruning is fun, and a good way to exercise. It is hoped that these remarks may make your exercising a little more enjoyable with the added reward of large baskets of good-sized, highly-colored fruit.

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the nutritional diseases that grow out of the soil

(*Continued from page* 37)

starving even while eating an ample supply of what he might term the "proper foods"—starving because those "proper foods" were being grown on land lacking in the basic elements needed in the human system.

Dr. Allison has worked mostly with Ozark cattle—each herd had Bang's disease. Dr. Allison took samples and had them analyzed with the spectograph. In each sick cow there was a deficiency in the trace elements, but those same elements were present in the blood of healthy cows. Milk analysis revealed corresponding deficiencies and so did soil analysis.

Another thing which the experiments revealed was that cows fed salts of the trace elements were immune to the disease even though in constant proximity with the diseased animals.

Dr. Allison knew he had something now. He began to experiment with sick animals with trace element salts and keeping a number of "control" animals to validify his findings. The results were highly gratifying. The sick animals began to respond. Within a few months their blood tests showed a completely negative check for Bang's disease. They were cured.

Dr. Allison extended his experiments into the realm of human life.

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The results have been amazing. The same minerals that cure cattle of Bang's disease also rid the human body of undulant fever and other diseases amounting to a list possibly as large as two hundred.

In the meantime, Dr. Francis Pottenger, Jr., North Canyon Boulevard, Monrovia, California, was working along the same line in cooperation with Dr. Allison with the trace elements as a nutritional factor in the treatment of tuberculosis which has won him wide acclaim.

In 1939 a new and mysterious disease appeared in a dairy herd in New York state. First attempts to learn what it was failed, and it was dubbed "X-Disease."

A report issued late in 1949 by the McCollum-Pratt institute of Johns Hopkins University in Baltimore tells of the work of a group of eminent American scientists to learn the cause and cure of X-Disease. Their first research, these scientists reported, had been for some infectious agent—virus, bacteria, parasitic fungus — which might cause the disease. But significantly, it was noted that the disease was highly localized in its appearance —it would strike in one herd and not touch cattle in adjoining fields. Furthermore, the disease was not transmitted from one animal to another.

Next, researchers turned to the pastures themselves. Perhaps some toxic weed was to blame. But why in one pasture and not in its neighboring meadow?

Spectographic tests were then made of the organs of animals affected and compared with those of healthy cows, and it revealed increases in silver, copper, manganese, molybdenum, thallium, and zinc over the amounts found in healthy cattle.

Accordingly, amounts of these various elements were fed to healthy cattle, one at a time, and molybdenum alone seemed to make the animal ill with the symptoms of X-Disease. The molybdenum content, furthermore, was unusually high in all legumes and grasses grown on the lands where X-Disease was prevalent.

Now what would have brought on molybdenum poisoning? These scientists again sought answers, but arrived at no definite conclusions. However, they had some pretty damning evidence which invites further research: "On every farm which had experienced losses from X-Disease, chemical fertilizers had been applied either to pasture or to the land on which the forage was grown—unusually large quantities of superphosphate—unusually large quantities of calcium carbonate limestone—and others," were used.

Were these factors to blame? Frankly, these scientists were uncertain. Further study, they indicated, is needed. But they did say this:

"It is known that overliming a soil greatly alters the availability to plants of the micronutrients present. Thus the available supply of copper, zinc, cobalt, and particularly of manganese and iron may be greatly reduced, while conversely that of molybdenum, vanadium and probably gallium, germanium, tallium and uranium is increased."

In other words, excess use of calcium carbonate limestone and superphosphates throws soils out of balance and appears to be dangerous.

One only needs to look at history to realize that the survival of the Nomad in his primitive agriculture depended on the fact that the cow went ahead of the plow. She was leading the people wherever their agriculture went. She inspected the natural forages and marked the land as being fitted to grow food for her owner as well as for herself. Agriculture of the old world put the plow where the cow had first gone to recommend that it be put there. It sent this capable chemist ahead to scout the areas.

Quite the reverse is the case in our

American agriculture. On much of our farm land the plow went ahead of the cow. We used no such capable chemist to put the stamp of approval on the fertility of the soil as a suitable and enduring food creator for both the cow and ourselves. We are now beginning to see that our problems of irregularities in conception and in the failures in calving, there are suggestions that the soils may be deficient in items to which we have not yet given sufficient nutritional significance. But, if we can take a suggestion from some feeding trials, the cow as a nutritionist cannot approve for her own consumption these inorganic minerals in a raw form when she can get salt water fish meal, which the spectograph says contains all the minerals known to science in a soluble organic form placed in the right balance by nature.

The prevention of most diseases in our livestock has more possibilities than treatment, and if trace mineral feeding of animal and soil will rid cattle of Bang's, then the very biased controversy on Bang's should cease its arguments, as too little has been done and too much has been said by too many who know nothing about Bang's disease whatever. It would be much better if we could learn how the soil atoms help maintain health.

The treatment of many diseases without proper nutrition is like trying to put out the fire by silencing the alarm bell!

growing asparagus

(*Continued from page* 41)

ing, for the seeds settle and the shells pour off with the water. After three or four washings, the seeds are spread on boards to dry in the sun a day. Then seeds are removed to a dry attic for about a week or so. When thoroughly dry, the seeds are stored in cloth or paper bags until needed.

Seed saving is quite a selective business. Even if parent plants are good, the fertilizing plant must be of a choice type also. Last seed heads are said to yield poor seed which seldom reproduces true. Seeds growing at the end of shoots or upper and lower extremities have the same defect.

Cooked asparagus is a universally appreciated delicacy. Yet it need not be cooked to be eatable. Try it raw, cut up with other vegetables, in a salad, for a tasty dish as well as good nutrition. Rich in silicon, high in phosphorus, and with a good proportion of potassium, sodium, manganese and iron, asparagus is especially healthful uncooked. Eaten raw, it has strong cleansing properties for the kidneys and bladder. The ancients knew and prized asparagus for its medicinal properties as well as its good eating. That moderns appreciate it is testified by an organic grower who cannot keep up with the demand for melt-in-the-mouth quality asparagus from his three-acre bed.

THE SOIL AND HEALTH FOUNDATION

A number of **Organic Gardening** readers during the past few months who have contributed to The Soil and Health Foundation have all expressed a strikingly similar wish: In offering aid to the fund devoted toward urgently needed agricultural and nutritional research, these readers have, almost in unison, expressed the earnest, enthusiastic hope that this vital work, spurred by the basic principles of the Organic Method, would help and hasten the realization of universal better health through better soil and agricultural practices; that all mankind may sooner enjoy the benefits of better-grown, better-tasting, more nutritious food. Won't **you** join in this important cause? Send **your** contribution—and **your** wish for a better future—to:

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Answers to Review Questions

(See page 19 Course in Organics)

1. True. The extent of the color is in proportion to the extent of decomposition and the exposure of the plant and animal compounds with their characteristic colors.

2. True. When the plant dies and the chlorophyl is dissipated, the colors of the other compounds show through as soon as a little decomposition takes place.

3. False. Darkness of color in humus stems from decomposition and reduction to simple compounds, the nature of organic matter from which it originates, the amount of oxidation, use of lime, chemical fertilizer concentration. Carbon actually has a wide range of colors, from white (diamond) to black (coal).

4. False. The dark colors arise mainly from the lignin, tannin and protein compounds of plant matter.

5. True. Although conditions such as an oversupply of manganese or the containing of a great amount of very old humus may make an unproductive soil dark, *usually* the darkness of the soil is a good indication of fertility.

6. True. The darker a substance, the more heat it will absorb. Because of this temperature difference, seeds will germinate and grow faster in dark colored soils.

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INSTANT COW MANURE. 3 pkts. make 3 gallons, 25¢; 100—2" Ferto-Pots, $2.75 prepaid. FERTO-GERM: Mineral fortified, Manure Compost. Contains millions of friendly bacteria. 50 lbs. $2.00; ton $60.00. Bacterial Digestors $550.00 up. Catalogue FREE. **ALLEN COMPANY, Pittstown 6, N. J.**

RUHM'S ROCK PHOSPHATE. Finest ground for Gardens, Lawns and Flowers. Quick service at a saving. 80 lb. bags $2.50, F.O.B. **A. B. STEDMAN, New York Mills, Minn.**

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Taste the difference in your Fruits and Vegetables. See the difference in your flowers and lawn. **HOOVER'S ORGANIC MIX.** A blend of Natural Products—Colloidal Phosphate, Marland, Lava Ash, ActivO and Organic Nitrogen. **HOOVER SOIL SERVICE SOUTHERN INDIANA AND OHIO DIVISION, Joe Francis, Mgr., R. 1, Terre Haute, Indiana.** Phone 952 Prairieton—Write for nearest dealer.

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EARTHWORMS. Red Domesticated, quickly convert leaves, manures, garbage, into rich soil. Breeders 1000—$6.50—mixed sizes, 1000—$4.00. **TERRACULTURE, 1901 No. Hoyt Ave., El Monte, Calif.**

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Buy Now! Endorsed, approved by gardeners ALL over the country.

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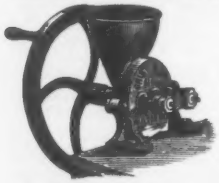

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NEW 64-PAGE EARTHWORM BOOK—"Raising Hybrid Earthworms for Profit"—all essential breeding information, plus valuable data on advertising and marketing—fully illustrated, $1.00 postpaid. ALSO: "Directory of Earthworm Hatcheries"—101 reliable sources in 34 states. Save time and money in buying breeders, bait, etc. Postpaid 50¢. EARL B. SHIELDS, Box 467-D, Mountain Home, Arkansas.

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Two Hundred Million Heart of Georgia QUALITY RED WIGGLERS ready for shipment. Contact me for your regular requirements. Shipping capacity 500,000 daily. Culture $4.00 per gallon delivered (contains approximately 1500 worms and eggs). RAINEY'S BAIT RANCH, Eatonton, Ga.

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DOMESTICATED CALIFORNIA REDWORMS from outdoor compost boxes. Let these silent workers renew your worn out soil. Breeders 100—$1.00; 500—$5.00; 1000—$8.50. Postpaid. ROCKY FORK WORM RANCH, Box 276, Hillsboro, Ohio.

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EARTHWORMS—BROWN NOSED ANGLE, greatest soil builder of all, very prolific. Breeders $7.00—1,000; mill run $5.00—1,000 prepaid. IVERSON'S WORM HATCHERY, 2743 53rd St., Des Moines, Iowa.

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RAISE BIGGER, BETTER FRUITS, VEGETABLES, FLOWERS, Etc.—by "harnessing" earthworms. First get unusual story, "An Earthworm Turned His Life"—Free. Write EARTHMASTER SYSTEM, Dept. 24, El Monte, Calif.

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GROW MILLIONS EARTHWORMS by our plan. 19 year's experience guides you. Most informative circulars, low prices, prompt shipment, get STARTED right. R. CALDWELL, Barwick, Ga.

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STOP GUESSWORK ABOUT YOUR GARDEN! Reliable laboratory analysis, complete recommendations for lime, plant food, organics, trace elements, $4.50. For full information and soil sampling directions, write **EDWIN HARRINGTON, Agricultural Chemist, Carversville, Penna.**

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GENUINE CIDER VINEGAR made from the juice of fresh whole New England apples. Two pint bottles, insured parcel post $2.00. **STERLING CIDER COMPANY, Sterling, Mass.**

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GRIND YOUR OWN WHOLE WHEAT, GRAHAM, BUCKWHEAT OR RYE FLOUR, or soft, fluffy meter ground corn meal with the genuine stone burr process (usually rarely available on local markets), at a cost little more than the price of the grain, on a **MEADOWS HOUSEHOLD STONE BURR MILL.** Will grind fine or coarse and requires only one horsepower motor plugged to any home outlet. Capacity 50 to 75 pounds per hour. No noise or dust objectionable for operation in kitchen. Full information direct from manufacturer. **MEADOWS MILL CO., North Wilkesboro, North Carolina.** For 50 years world's largest manufacturer of commercial stone burr mills.

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NATURAL HEALTH PRODUCTS—finest quality. Iodine Ration (Kelp) Tablets, 300—$1.25. Brewer's Yeast Tablets, 7½ gr. USP, 1000—$1.75. Brewer's Yeast Powder, pound—$1.00. Vitamin A & D Capsules, 200—$1.50. Rose Hips Tablets, 100—$1.25. Rose Hips Tea, 5 oz.—$1.00. Freshly Hulled Sunflower Seeds, pound, $1.40. Wheat Germ Oil Capsules, 500—$2.75. Liver Tablets, 100—$1.75. Vitamin A, 25,000 Unit Capsules, 100—$1.65. Bone Meal Tablets, 100—$1.00. Bone Meal Powder, pound—$1.50. Postage Prepaid—Satisfaction Guaranteed. Free Price List. **BARTH'S, Dept. 718-OG, Woodmere, N. Y.**

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A HAPPY HEALTHY VACATION. Girls 6 to 14 on California Mountain Ranch. Organically Grown Fruits and Vegetables. Raw Milk and Honey. Swimming, etc. Write **MRS. CHARLOTTE AUSTIN, R.N., Zig Zag Ranch, Oak Run, Calif.**

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COTTAGES accommodating 2 to 5—Lodges 6 to 10. Electric Kitchens, fireplaces, showers. Weekly, monthly rentals. Sports, boating, fishing. Organically grown vegetables. **JOURNEYS END, Brattleboro, Vermont.**

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RAISE ORCHIDS—at home—big profits—fascinating. Year 'round, any climate. NO GREENHOUSE. Instructions, INCLUDING 3 ORCHID PLANTS, sent for no-risk examination. FREE details. **FLOWERLAND, 6018D S. Vermont, Los Angeles 5, Calif.**

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PROSPECTIVE UNIVERSITY GRADUATE, energetic, healthy, age 32, (S), is seeking a career in health-food business. Desires to contact purveyors of health foods for making sales and distribution, or to sell food products from health farms. Also would be interested in working around health farm. Area limited to East and North. **PAUL E. HART, 1719 Mass. Ave., NW, Washington, D.C.**

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2 ACRES—organic home acreage, 20 kinds fruit, 1 acre commercial lemons, restricted rural residential, 7 room house, ocean 5 miles. **RANCHO SANTA FE, Box 86, San Diego County, Calif.**

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BEST BAKED GOODS YOU'VE EVER TASTED. Made from 100% STONE GROUND ORGANICALLY GROWN WHOLE GRAINS, honey, fresh milk, raw sugar, butter, eggs, yeast, NO preservatives or bleaches. Breads, cookies, etc. Also huge selection of all natural foods. We ship regularly to customers throughout U. S. Guaranteed fresh delivery. Send 50¢ coin for delicious loaf bread & catalog postpaid. **STONE MILL PRODUCTS, Dept. BB-5, 1014 Franklin St., Grand Rapids, Michigan.**

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THE BEST BREAKFAST CEREAL IN AMERICA. VITA CEREAL made from Toasted Almond flakes, Cocoanut, Wheat Germ, Wheat Flakes. Energy and Vitality food. Vitamin Candy. No sugar. Contains Dates, Walnuts, Wheat Germ, Honey. Send $2.00 we ship 1 Box Candy mixed. Weeks supply Vita Cereal for 2 prepaid. Stone ground flour and cereals. Healthfoods. **THE MILL, Box 699, Lodi, Calif. Ask for folder.**

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OLD FASHIONED SEEDLESS RAISINS! Organically grown without poisons, commercials. Sweet—70% unrefined grape sugar. Sun-dried. Ship. wts. **POSTPAID PRICES:** 11 lbs. $4.55, 4 lbs. $1.85. **GILBERT'S ORGANIC FARM, Rt. 2A, Sultana, Calif.**

TREE RIPENED FRUIT—Oranges, Grapefruit or Mixed. $2.50 bushel, average express $2.16. Organically grown, mixed sizes, no washing, gas or sprays. Satisfaction guaranteed. Add $1.25 five pounds Florida Honey shipped with fruit, postage extra if mailed. **GARLITS, Seffner, Florida.**

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... Specify either with Vitamins or Plain ...
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Each tablet contains 7½-grains of Purified Bone Meal with 100 USP Units Natural Vitamin D (Fish Liver Oil) and flavored with Wintergreen Oil for palatability. May be crushed or swallowed whole.
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Each capsule contains 7½-grains of Purified Bone Meal with 100 USP Units Natural Vitamin D (Fish Liver Oil). Easy to swallow.
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Each capsule contains 7½-grains of Purified Bone Meal without Vitamins—plain.
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BONE MEAL POWDER—PLAIN—(BULK)
May be incorporated into Muffins, Breads, Soups, Cereal or any type of food of the diet.
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Each capsule contains 7½-grains of Purified Bone Meal and "High-Potency" Brewer's Yeast.
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A Natural Oil Shampoo for that Soft, Silky Natural Hair Beauty

For a wonderful new "feel" to your hair . . . for clean sparkling highlights and gorgeous natural charm . . . try new, different GREEN FOAM Shampoo.

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This foaming green scalp and hair cleanser is highly concentrated. Apply only a few drops. Your hair billows out in a foaming lather. Dirt, dandruff and other hair accumulations are surrounded, picked up and ridden away on a wave of suds. Leaves your hair soft and lovely, your scalp pink and clean. Order GREEN FOAM Shampoo today for soft, clean, lovelier hair!

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MASTER-FORM HAIR Creme . . .

Exciting New Hair Preparation

It's new! Only formula of its kind . . . for men, women, children who want a **natural** hair treatment and a **greaseless** hair dressing.

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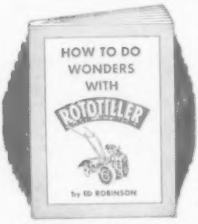

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